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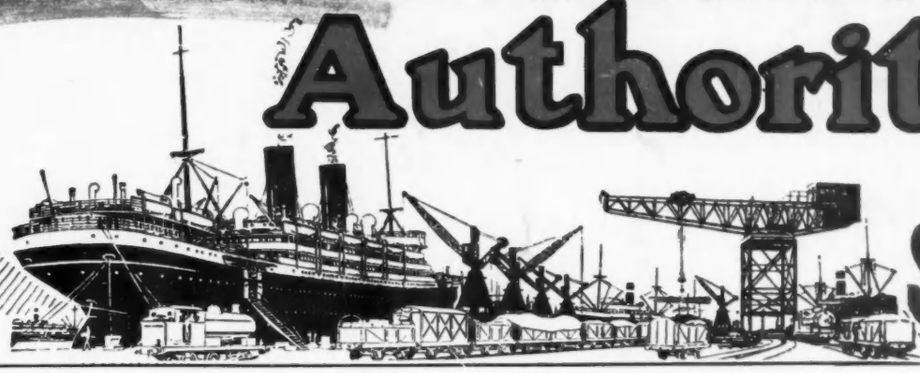

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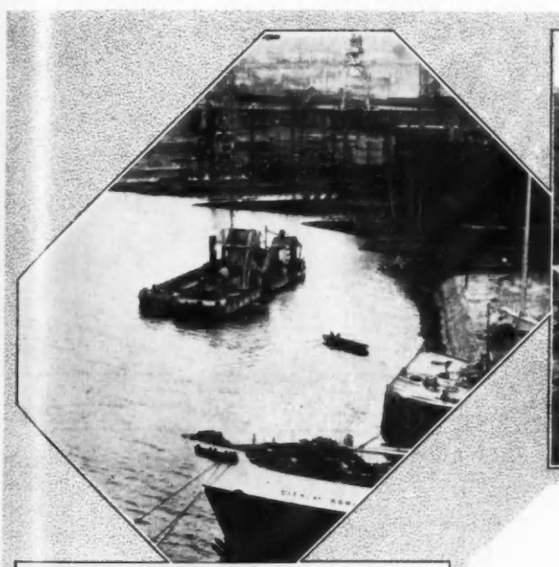

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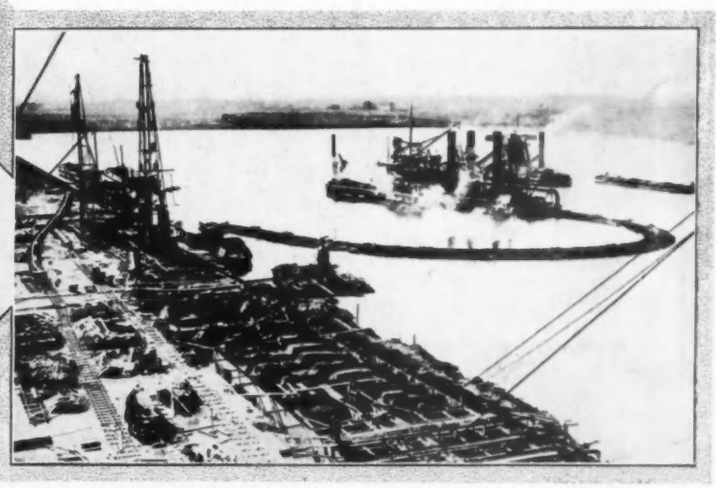

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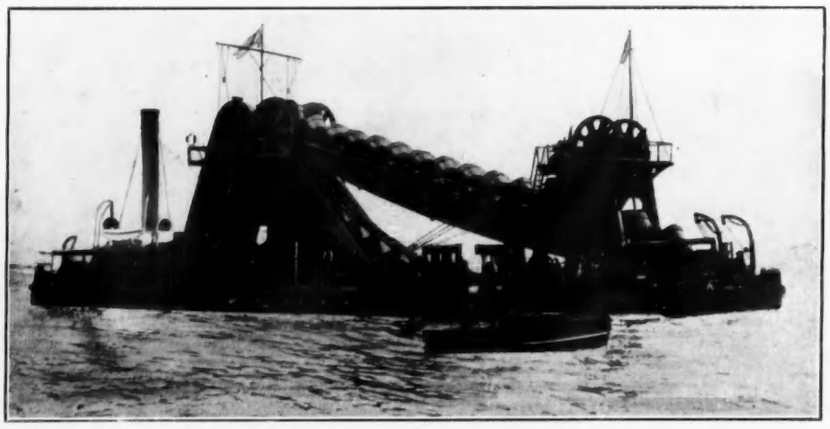

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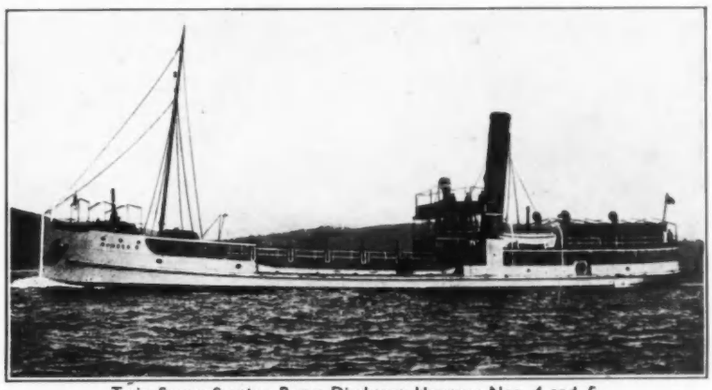

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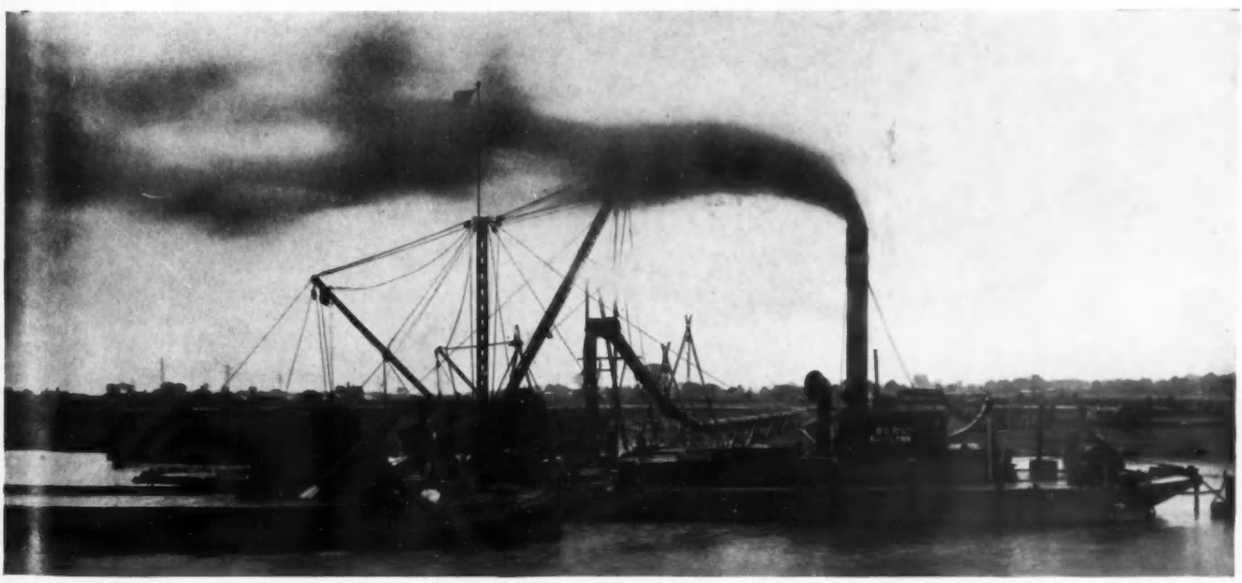

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The Dock and Harbour Authority

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Editorial Comments

A Great Lake Port.

Among the great inland ports of the world, Chicago, the subject of this month's leading article, occupies a position in the front rank. Located right in the heart of the North American Continent, with a hinterland almost incalculably vast, it is in an extremely favourable position for commanding the trade of the surrounding region, especially that of what is called the " Middle West." Moreover, it is exceptionally endowed with an ample deep water frontage and with waterway communications through an avenue of lakes which, by reason of their recessed and land-locked situation, are free from many of the major risks attendant on ocean navigation while at the same time, they are able to provide sufficient depth for seagoing vessels. This natural endowment is reinforced by a vast network of railways, which extends to the furthest limits of the Federal Union. Indeed, Chicago is probably the greatest railway centre in the world: no less than 22 main lines converge upon it, in addition to the numerous local lines and connections within the city and its environs.

The waterborne traffic of Chicago is of the order of twelve million tons annually, the greater part of it being traffic with other American lake ports. There is a relatively small portion, amounting to 5 or 6 per cent. with Canadian ports and others further afield. In order to provide for this great flow of waterborne commerce, comprising grain, and raw materials for the iron and steel industries, as well as general produce, the frontages of the city to the lake and the Chicago River have been developed with appropriate quayage and cargo-handling equipment. The river with its branches passes right through the centre of the city, amid busy thoroughfares, necessitating the provision of some 60 movable bridges to enable street traffic to be maintained with as little interruption as possible.

The harbour area, some 700 acres in extent, is protected by substantial breakwaters, for it has to be borne in mind that though these North American waters are designated lakes, they are, in reality, respectably-sized seas, subject to storms which, if not of Atlantic or Pacific Ocean intensity, are formidable enough to the class of vessel navigating them. Although lacking personal experience of an actual storm, we have had acquaintance with fairly rough weather on one of these lakes in a top-heavy passenger steamer, which gave rise at the time to uncomfortable misgivings on our part as to stability and security against capsizal, so that we could well imagine the destructive effects of a gale.

The Chicago River has the peculiar, and we should imagine the unique, feature that its direction and current have been artificially reversed. Formerly the discharge was into Lake Michigan, but now it takes place into the Sanitary and Ship Channel which flows in a Southerly direction from the City to link up with the Illinois River and ultimately finds its way into the Mississippi and the Gulf of Mexico. The Channel, which was first completed and opened in 1900, is a noteworthy engineering achievement, carried out with some subsequent improvements at a cost of 70 million dollars. By means of cutting through a low ridge of limestone rock a few miles West of Chicago, forming the divide between the watersheds of the Des Plaines and Chicago rivers, a canal, 34 miles long, about 200-ft. wide and 24-ft. deep has been formed and now constitutes the outfall of the Chicago River in place of Lake Michigan. The reversal of flow is accomplished by controller works, including a lock, 600-ft. long by 80-ft. wide at the lake side. A certain quantity of water has to be abstracted from the lake to facilitate the flow of sewage in the Channel. At first, this amounted to 9,000 cu. ft. per second, but by the construction of later sewerage works the quantity has been reduced to 1,500 cu. ft. per second.

The Calumet River has been treated in the same way as the Chicago River and its waters also have been diverted into the Sanitary and Ship Canal.

Unfortunately, Lake Michigan is the source of the city's water supply and, despite all precautions, there was clear evidence of contamination by sewage. This continued even after the intake pipes had been extended 8 miles into the lake. Accordingly, in 1938, a new controlling station and lock were opened to eliminate storm water and serve, not only for sanitation, but also for navigation, the ultimate object being the creation of an all-water route between the Great Lakes and the Gulf of Mexico.

Chicago, it is said, derives its rather singular appellation from the Indian *Chacaqua*, the name of the God of Thunder, probably from some association with thunderstorms in the locality. From a primitive settlement it has now attained the position of second city in the United States, the population of the city proper at the last census being 3,376,438, while that of the entire metropolitan area was 4,364,755. In 1871, it suffered a serious setback by a tremendous conflagration, which did damage to the extent of nearly 200 million dollars.

The city is the focus of intense commercial and manufacturing activity. It is the largest centre of rail and air traffic in the United States, and perhaps in the world. It has an outstanding grain market with a storage capacity in its silos for nearly 30 million bushels. There are great iron and steel industries requiring huge supplies of iron ore, limestone and coal and its food products are distributed all over the world.

In presenting to our readers the article in this issue, we must express our great indebtedness to the information contained in the monograph on the port, prepared with painstaking care and thoroughness by the United States Army Corps of Engineers. It forms No. 4 of the Lake Port Series and like all the other volumes, in the U.S. Port Series, is a remarkably praiseworthy compendium of particulars of port accommodation, facilities and trading activities. We could wish that there were an official counterpart in this country relating to British ports.

Wholesale Quayside Robberies.

The instances which has been given in recent issues of the persistent prevalence of thieving at ports fade into relative insignificance in comparison with the scandalous wholesale robbery of imported meat at the Port of Liverpool which has just been made public. Three men (one of them a Ministry of Food Inspector!) have been sentenced at the Liverpool City Quarter Sessions to substantial periods of penal servitude for participation in the theft of 2,153 carcases of lamb or packages of beef, of the total value of over five thousand pounds. The thefts were systematically made from five ships over a period of two months.

Crime against the community on such a colossal scale, especially in regard to foodstuffs during a national emergency,

Editorial Comments—continued

when food is strictly rationed and supplies are only obtainable at the risk of the lives of brave British seamen, is of an extremely grave nature and calls for repressive measures of the severest intensity. The offence, in fact, is as bad as, if not worse than, looting after air raids, for which the statutory penalty is death, or imprisonment for life. So far, capital punishment has not been inflicted, but it is easily imaginable what action would be taken by the Germans with their own or subject nationals in such cases.

In sentencing the prisoners, the Recorder, Mr. E. G. Hemmerde, K.C., said:—

"It is obvious that there is something going on which is so bad that it might have been organised by a Fifth Column. After two years of war, when Russia has burned 2,000 miles of her country to help not only herself, but also her partners in the war, the fact that we are only beginning to clean out these conditions at the Liverpool Docks is a public scandal."

A public scandal, indeed! And it is greatly to be feared that there are similar incidents of this kind elsewhere (mostly unknown to the public) which raise the matter to the level of a national scandal. It is high time that some very drastic steps were taken to repress, and, if possible, to eradicate, an evil which, judging from press reports, grows from day to day. Even as this paragraph is being penned, we read that culprits have just been sentenced in connection with the disappearance of 15,000 cigarettes from a Northern port, while in course of being shipped to destinations overseas for the benefit of British troops. Could any theft be meaner or more despicable?

Southern Railway and Cunard-White Star Line.

In compliment to the Cunard-White Star Ltd., the Southern Railway Company have named one of their "Merchant Navy" class of mixed traffic locomotives after the shipping company. At the naming ceremony on January 1st, Mr. H. Holland Martin, chairman of the Southern Railway, said that the connection of the Railway with the Cunard-White Star Line was one of old standing and of great affection. "Since the line went to Southampton, the Southern Railway had fitted out docks and graving docks to suit their ships, first the Ocean Dock and then the King George V Dock that would take the line's largest ships. To-day few passenger ships were using Southampton, but the time would come when Southampton would again be the greatest passenger port, and the ships would once more weave still closer the bonds between ourselves and Canada and ourselves and the United States and the other free nations of the world."

Sir Percy Bates, chairman of Cunard-White Star, Ltd., in naming the engine, stated that "had it not been for the courage and enterprise of the Southern Railway, the big ships of the Cunard-White Star Line would never have come into existence. The dry dock at Southampton was an essential part of that line which, starting from anywhere in England, might finish up anywhere in the United States or Canada."

Dockside Absenteeism.

It is disappointing to learn from the Christmas Eve issue of the broadsheet, *The Hook*, circulated by the Regional Port Director at ports of the North Western area, that the number of dock workers who fail to report to particular ships on the second or following days after allocation is growing. A serious view is naturally taken of these failures and the broadsheet warns port workers that, in future, such delinquencies will be carefully investigated, and where no adequate reason for the failure is forthcoming, severe disciplinary action will follow. After the well-merited praise which has been bestowed upon the gangs of workers as a body, this lapse from the high standard of achievement in recent months is an anti-climax as regrettable to record as it is prejudicial to the national war effort. Well may the Director admonish the men that though "dockers do not manufacture supplies, yet 100 per cent. production will be useless if there is delay in turning ships round." It is to be hoped that the men will take the reproof to heart.

Developments in Navigation Fog Signalling.

An extremely interesting and valuable series of tests with new electrical sound-reproducers, for possible use as fog signals at lighthouses, and also of new sound-operated fog signal controllers, has recently been carried out at the fog signal testing laboratory of the United States Coast Guard at Cape Henry, Virginia.

The U.S. *Coast Guard Bulletin*, which publishes a report on the result of the tests, announces that the possibility of using electrical transcribing and reproducing apparatus in connection with fog signalling is being closely studied, since it is clear that, if apparatus of this kind can be devised to meet the needs of the service, the operation of signals will be possible with a less demand for power than is at present required for diaphones, typhons, oscillators, horns and other sound-producing instruments.

As regards the second type of apparatus, viz., that of intermittent operation of a fog signal only when needed, this places the control of the signal in the hands of the mariner himself, so that he is able to make use of it whenever occasion requires. Such a method of signal operation obviously would put an end to the naturally strong opposition to constantly operating fog signals in the vicinity of inhabited districts on the coastline. The ability of a passing vessel to actuate a fog signal at need by some action on the vessel itself, would also enable unattended signalling stations to be brought into general use. The fundamental object in making the tests was to arrive at a system of signals which would sound solely when needed and at no other time. To all who have suffered from the continuous hooting throughout foggy nights of raucous foghorns, the achievement of this object would be a much appreciated relief, apart from the concurrent saving in electrical energy.

The following particulars of the mechanism, as given in the *Bulletin*, are reproduced from *Lloyd's List*.

The sound reproduction apparatus demonstrated consisted of two distinct types. One was a 15-unit wide angle vertical stack reproducer designed to transmit a horizontal fan of sound in much the same manner a lighthouse lens focusses light in a horizontal plane. The other was a 48-unit superpower reproducer designed to transmit sound in a pencil beam much as a clear parabolic reflector points light. Also demonstrated were a minor electric multiple fog signal, and a sound-operated signal controller.

The principle of sound transmission as demonstrated by the 15-unit reproducer may facilitate the production of fog signal tones with a material reduction in driving power. A further aim is to minimise the effect of silent areas now observed at many fog signal stations by elimination of reflected and infracted sound from air strata of varying density. This signal may compare favourably as to range with smaller air diaphragm units.

The 48-unit superpower reproducer is somewhat more powerful than the vertical stack, and consists of sound units (loud speakers) arranged in a closely-grouped fashion. Its design causes sound to be projected in a pencil beam much as a parabolic reflector points light. The weather conditions and lack of time during the tests did not permit full demonstration of the possibilities of this unit.

The minor group of eight sound reproducers, showed the greatest promise. They were heard with satisfactory volume between two and three miles. They require approximately the same power and battery voltage as the electric trumpet horn now quite widely used in the Coast Guard. Their tone is much better, consisting of a mixture of the sound structure from two basic fog signals of 240 and 270 cycles, generated by vibrators similar to those used in low-voltage radio receivers. A two-horn signal of this type is now in commission at Barnegat Inlet, South Jetty, N.J. Their performance was sufficiently promising to justify their adoption for a number of isolated points, especially in Alaskan waters.

The sound-operated controller exhibited during the tests was perhaps the most spectacular part of the equipment. It is a low power-driven unit which keeps a fog signal inoperative except when tripped into operation by the sound from a ship's whistle. During preliminary tests a fish horn started the equipment at a distance of a quarter of a mile. A large steam whistle would actuate the controller at considerably greater distances. The controller depends upon the same reproducers which make the fog signal for its ears, since they serve by electrical interlock as microphones during the interval they are not actually sounding. Such control of the operation of a fog signal has had quite extensive trial at Back Creek in the Chesapeake and Delaware Canal, and may prove practicable at other places. In the two larger units it is possible to transmit the human voice instead of the fog signals.

Tyne Commission Finances.

In his recent New Year address to members of the staff, Sir Arthur Sutherland, chairman of the Tyne Improvement Commission, emphasised the fact that the Commission was passing through difficult times. Finances in particular were a serious problem. The Commission, he said, had had to put their dues by 100 per cent. above pre-war level and the Government had told them that they would not allow them to have any further increases. Therefore, if they got into debt, they would have to try to get the Government to help them, though it was hoped that such a necessity would not arise.

Turning to the subject of dredging in the river, Sir Arthur mentioned that for financial reasons, instead of dredging two million tons out of the Tyne "as they might do every year," this year only one million tons was being dredged. The balance would have to be made up after the war, in the same way as would other maintenance and repair work.

The Tyne Commissioners are, of course, best and indeed, alone qualified to judge the direction in which economies in maintenance work can most effectively be made, but we may, perhaps be allowed to express the apprehension that there is a danger in cutting down dredging operations, since the maintenance of adequate depth in the navigable channel is essential not only to the well-being, but to the very existence of a port. It is to be hoped that so drastic a reduction as 50 per cent. will not have to be in force for any length of time.

*The Port of Chicago, Illinois**

A Notable American Lake Harbour

Location and General Description.

THE City of Chicago lies in North-eastern Illinois, on Lake Michigan near its southern end. The port may be considered as including Chicago and Calumet Harbours and their tributary waterways extending as far inland as the city limits. By water it is 85 statute miles distant from Milwaukee, 633 miles from Detroit, 893 miles from Buffalo, 1,244 miles from Montreal, and 808 miles from Duluth.

In the following descriptions of the channels in Chicago and Calumet Harbours, all depths are referred to the low-water datum of Lake Michigan which is 578.5-ft. above mean low water at New York. Ordinary fluctuations of water level range from 0.9-ft. below to 0.1-ft. below, and extreme fluctuations range from 1.3-ft. below to 3.8-ft. above low water datum.

Chicago Harbour includes the protected areas in Lake Michigan and the entrance to Chicago River up to the bridge at Michigan Avenue, a distance of 0.87 mile. The protected area extends along the city frontage for a distance of about 2.25 miles, comprising an area of about 714 acres. The depths in the harbour vary from 21 to 27-ft.

Chicago River divides into the North and South Branches about 1.58 miles west of the river entrance. The head of navigation on the North Branch for commercial vessels is at a point about 6 miles from Michigan Avenue Bridge. The South Branch divides into the West and South Forks at the South Branch turning basin some 4¾ miles from the Michigan Avenue Bridge.

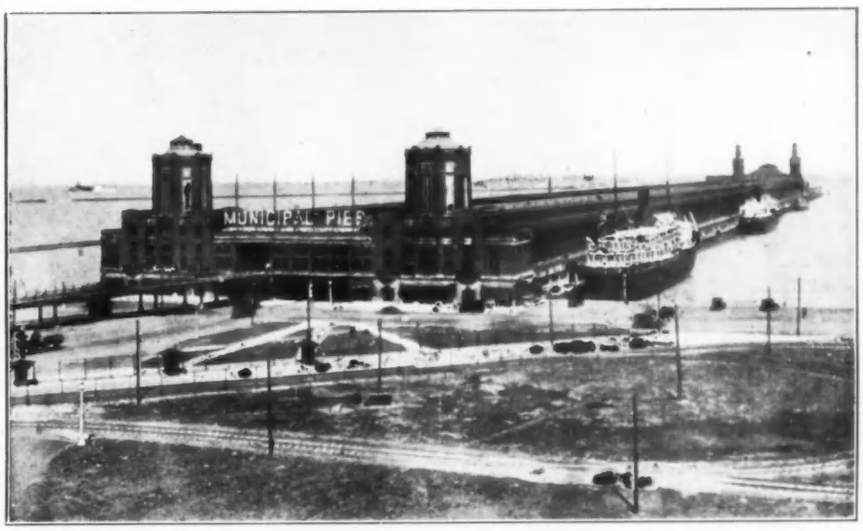
The West Fork of the South Branch of the Chicago River joins the Chicago Sanitary and Ship Canal at Damen Avenue, 5¼ miles from Michigan Avenue Bridge. The canal was completed by the Sanitary District of Chicago in 1900 for the purpose of reversing the flow of Chicago River, and the controlling works at the mouth of the river were completed in 1938, thus preventing sewage from entering Lake Michigan. This canal extends from Damen Avenue at Lockport, Ill., a distance of about 30 miles and provides a channel 24-ft. deep with a bottom width varying from 160 to 202-ft. The Federal Government is improving the Illinois River and accessory waterways from Lockport to the mouth of the river, which will provide a through channel 9-ft. deep from Chicago to the Mississippi River, a distance of 325 miles.

Under authority of an act of Congress approved March 3rd, 1899, the Sanitary District of Chicago constructed controlling works at the mouth of the Chicago River, to prevent, at times of high water, a reversal of the flow of the Chicago River into Lake Michigan. The controlling works are so operated that the water level in the Chicago River is maintained at a level lower than that of the lake, except in times of excessive storm run-off into the river or when the level of the lake is below minus two feet, Chicago City datum. The lock chamber, which forms a part of the controlling works, provides a clear length of 600-ft., and a clear width of 80-ft. The depth over sills is 24.4-ft. below Chicago City datum, or 23.0-ft. between low water datum for Lake Michigan. The controlling works are operated by the Sanitary District of Chicago subject to rules and regulations prescribed by the Secretary of War.

The controlling depths in the river and its branches as of January, 1938, were as follows: In the main river 21.6-ft.; North Branch, from the junction with the South Branch to the North Branch turning basin at North Avenue, 20.9-ft.; in the turning basin from 19 to 21-ft.; North Branch Canal, 19.3-ft.; from the turning basin to Barry Avenue, 18-ft.; thence to Belmont Avenue, 12.6-ft. Soundings taken in 1929 show a navigable channel of 21-ft. in the South Branch. Between Taylor Street and Eighteenth Street the South Branch has been straightened.

Calumet Harbour, also known as South Chicago Harbour, is located near the southern end of Lake Michigan, about 11½ miles from Chicago Harbour. The outer harbour and Calumet River entrance are protected by a breakwater 6,923.8-ft. long, and a detached breakwater 5,007-ft. long, in continuation, completed in 1935, which shelter an anchorage area of about 850 acres. The harbour and entrance channel have a depth of 26-ft., and the Calumet River, for a distance of about 5.6 miles, has a depth of 21-ft. in mid-channel.

Calumet River connects with Lake Michigan at Calumet Harbour. Since the opening of the Calumet-Sag Canal, constructed by the Chicago District to connect the Little Calumet River with the Chicago Sanitary and Ship Canal, Calumet River has a reverse flow similar to that obtaining in the Chicago River. The river channel is 200-ft. wide between docks and has been dredged to a depth of 21-ft. to the plant of the General Chemical Co. and from this point to " The Forks " and in turning basin No. 5 to 21½-ft. At " The Forks " there is an entrance channel to Lake Calumet having a 200-ft. width, and a depth of 21-ft. About 1.61 miles above " The Forks " is the junction of Calumet River and Little Calumet River. From this junction North-easterly about 0.42 miles along the Little Calumet River is the junction with Grand Calumet River. Lake Calumet is about 3½ miles long and about 1½ miles wide. It has the same level as Lake Michigan, and an average depth of about 2-ft. at low water datum, except for the improved area. Dredging completed in October, 1937, provided a depth of 21-ft. in a harbour area at the south end of the lake, with a length of about 3,000-ft. and a width varying from 500 to 850-ft.



View of Navy or Municipal Pier.

From " The Forks " to the entrance to the Calumet-Sag Channel at Blue Island, the river has been dredged to a minimum depth of 9-ft., with a minimum bottom width of 220-ft. The Calumet-Sag Channel has a controlling depth of 9-ft. throughout its entire length of 16.2 miles. The earth sections have a bottom width of 36-ft. with slope sides of one or two, or a 50-ft. bottom width with side slopes of one on one. The rock sections have a width of 60-ft. with vertical sides. This channel is too narrow for large boats to pass, consequently three passing places have been constructed by the Federal Government, each 90-ft. wide measured from the present bottom width of the channel, and located as follows: No. 1, immediately West of Ninety-sixth Avenue, extends about 3,700-ft. Westerly; No. 2, immediately East of Ridgeland Avenue, extends about 4,100-ft. Easterly; and No. 3, immediately East of Crawford Avenue, extends about 3,800-ft. East.

Currents

There are no tides on Lake Michigan, but the lake is subject to frequent changes in elevation over very short periods of time and may fluctuate as much as 1-ft. in less than half-an-hour. Such sudden changes in elevation are known as seiches, resulting from variations in barometric pressure. At other times the level is affected by winds of sufficient velocity to drive the surface water forward in greater volume than that carried by the lower return currents, thus raising the elevation on the lee shore and lowering it on the weather shore.

The Chicago River originally discharged into Lake Michigan but now discharges into the Chicago Sanitary and Ship Canal, the current having been reversed when the canal was completed. The current in the Chicago River and its branches depends upon the amount of water diverted from Lake Michigan. This diversion is controlled by the controlling works recently installed at the mouth

*Reproduced in condensed form from Report in Lake Series, No. 4, issued by the Corps of Engineers, U.S. Army.

Port of Chicago—continued

of the river. Since January, 1939, the diversion does not exceed 1,500 cubic ft. per second.

The current in the Calumet River also depends upon the amount of water diverted through the Calumet-Sag Channel, which ultimately reaches the Chicago Sanitary and Ship Canal. The current in the main river is rather sluggish, but from the mouth to the Forks it varies from one-fourth to one-half per mile per hour, and from the Forks to the entrance of the Calumet-Sag Channel from 1¼ to 1.4 miles per hour. The current in Calumet River is reversed to flow into Lake Michigan at times of heavy rainfall, seiches, sudden lowering of the lake level, or a combination of these conditions. The diversion through the river is regulated by the controlling works at the head of the Calumet-Sag Channel.

Anchorages

The approved anchorage grounds at Chicago Harbour, together with the rules and regulations relating thereto, are given below:

Anchorage A.—South-west of a line parallel with and 150-ft. South-westward of the extension breakwater; West of a line parallel with and 150-ft. West of the South extension of the exterior breakwater; North-east of a line parallel with and 1,500-ft. Southward of the exterior breakwater; and East of a line parallel with the South extension of the exterior breakwater and 100-ft. Eastward of the West end of the exterior breakwater. The total area is about 161 acres. This area is reserved for commercial vessels operated for profit. Floats or buoys for marking anchors or moorings in place and fixed mooring piles or stakes are prohibited in this area.

Anchorage B.—West of a line parallel with and 150-ft. West of the South arm of the exterior breakwater; North of a line perpendicular to the South arm at its South end; East of a line parallel with the South arm about 2,200-ft. therefrom and on line with the East face of the municipal pier; and South of a line perpendicular to the South arm 700-ft. from its North end. The total area is about 94 acres. This area is reserved for commercial vessels operated for profit. Floats or buoys for marking anchors or moorings in place and fixed mooring piles or stakes are prohibited in this area.

Anchorage C.—South of a line parallel with and 150-ft. Southward of the shore arm of the exterior breakwater; West of a line parallel with the South extension of the exterior breakwater, 100-ft. Westward of the East end of the shore arm, and on line with the East face of the solid fill at the shore end of the municipal pier; North of a line parallel with and 600-ft. North of the North face of that fill; and East of a line parallel with and 600-ft. lakeward of the Lake Shore Drive revetment. The total area is about 80 acres. Commercial vessels operated for profit and measuring more than 50 gross tons are forbidden to anchor in this area. Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes are prohibited.

Anchorage D.—West of a line parallel with and 400-ft. West of the Easterly breakwater; North of a line perpendicular to the Easterly breakwater at its South end; East of a line parallel with and 150-ft. East of the Grant Park revetment; and South of a line perpendicular to the Easterly breakwater and 150-ft. South of the Illinois Naval Reserve Pier. The total area is about 54 acres. Commercial vessels operated for profit and measuring more than 50 gross tons are forbidden to anchor in this area. Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes are prohibited. Steamers and motor vessels measuring over 5 gross tons are forbidden to use this area as a through channelway.

Anchorage E.—North-west of a line parallel with and 150-ft. shoreward of the Southerly breakwater; East of a line parallel with and 150-ft. East of the Grant Park revetment; and South of a line perpendicular to the North section of the Southerly breakwater at its North end. The total area is about 35 acres. Commercial vessels operated for profit and measuring more than 50 gross tons are forbidden to anchor in this area. Temporary floats or buoys for marking anchors or moorings in place will be allowed in this area. Fixed mooring piles or stakes are prohibited. Steamers and motor vessels measuring over 5 gross tons are forbidden to use this area as a through channelway.

There are no approved anchorage grounds at Calumet Harbour, Ill. However, the breakwater provides an anchorage of 850 acres, 26-ft. deep. This anchorage is used by vessels during storms and when waiting to unload ore at docks along the river. During the winter the river is used to lay up vessels.

Weather Conditions

Open Season for Navigation.—The navigation season is generally considered to extend from April 15th to December 1st. However, there is some navigation at the Port of Chicago during the entire year. Winter navigation consists of vessels dredging sand from Lake Michigan for commercial purposes, and those using the Chicago and Calumet Rivers.

Prevailing Winds.—The prevailing wind at the Port of Chicago is south-west. The region is subject to severe storms and high winds, especially from the north-east.

Ice.—Ice seldom forms on the Chicago or Calumet Rivers. The outer harbour is occasionally frozen.

Fogs.—Fogs are more prevalent from October to May than during the remainder of the year. As a whole there is little fog, the record for the past 43 years being an average of 11 days per year. Chicago Harbour is frequently subject to heavy smoke palls resulting in very poor visibility.

Precipitation.—The United States Weather Bureau reports for the past 67 years show that the average precipitation has been 32-86-in.

Temperature.—The annual average temperature for the past 67 years has been 49.3° Fahrenheit.

Bridges

The Chicago River and its navigable branches are crossed by 60 bridges. Of this number 54 are of the bascule type, 5 are swing bridges, and 1 is a vertical lift bridge. On the river between the controlling works and junction with the North Branch, a distance of 1.46 miles, there are 10 bridges, including 1 over Ogden Slip. The distances between these 10 bridges very from 0.06 to 0.54 mile, the majority being less than 0.1 mile apart. There are 20 bridges across the navigable portion of the North Branch of the Chicago River in a stretch of about 5 miles, the distances between which vary from 0.03 to 0.59 mile. On the South Branch there are 21 bridges in a stretch of 3.64 miles, the average distance between which is 0.18 mile. The remaining bridges are located on the North Branch Canal, the West Fork of the South Branch, and the South Fork of the South Branch. There are 12 bridges across the Calumet River between the Lake and "The Forks" at Turning Basin No. 5, six of which are of the bascule type, three are swing bridges, and three are vertical lift bridges.

Harbour Improvements by the United States

Chicago Harbour.—Originally the harbour could be used by small craft, and only then when temporarily deepened by scour due to freshets. The Chicago River entered Lake Michigan across a shifting bar about one-half mile south of its present mouth, and the harbour was limited to the portion of the river east of Rush Street, a distance of about one-half mile. The original project was adopted by the River and Harbour Act of March 2nd, 1833, under which a new mouth was cut for the river, thus providing a straight outlet, and the north and south piers were constructed. Dredging to maintain an average depth of 14-ft. was carried on intermittently from 1833 to 1870, and the piers at the mouth of the river were extended by the United States Government and the City of Chicago.

The existing project, completed in 1923, was authorised by the River and Harbour Acts of July 11th, 1870; June 14th, 1880; March 3rd, 1899; July 25th, 1912; and March 2nd, 1919; it provided for the following work:

(a) An inner breakwater, all of timber cribs, enclosing an inner basin of about 224 acres in extent, the breakwater being in two sections, as follows: The main inner breakwater, 4,036-ft. long with 300-ft. of shore return on the north end, and a southerly extension 2,550-ft. long.

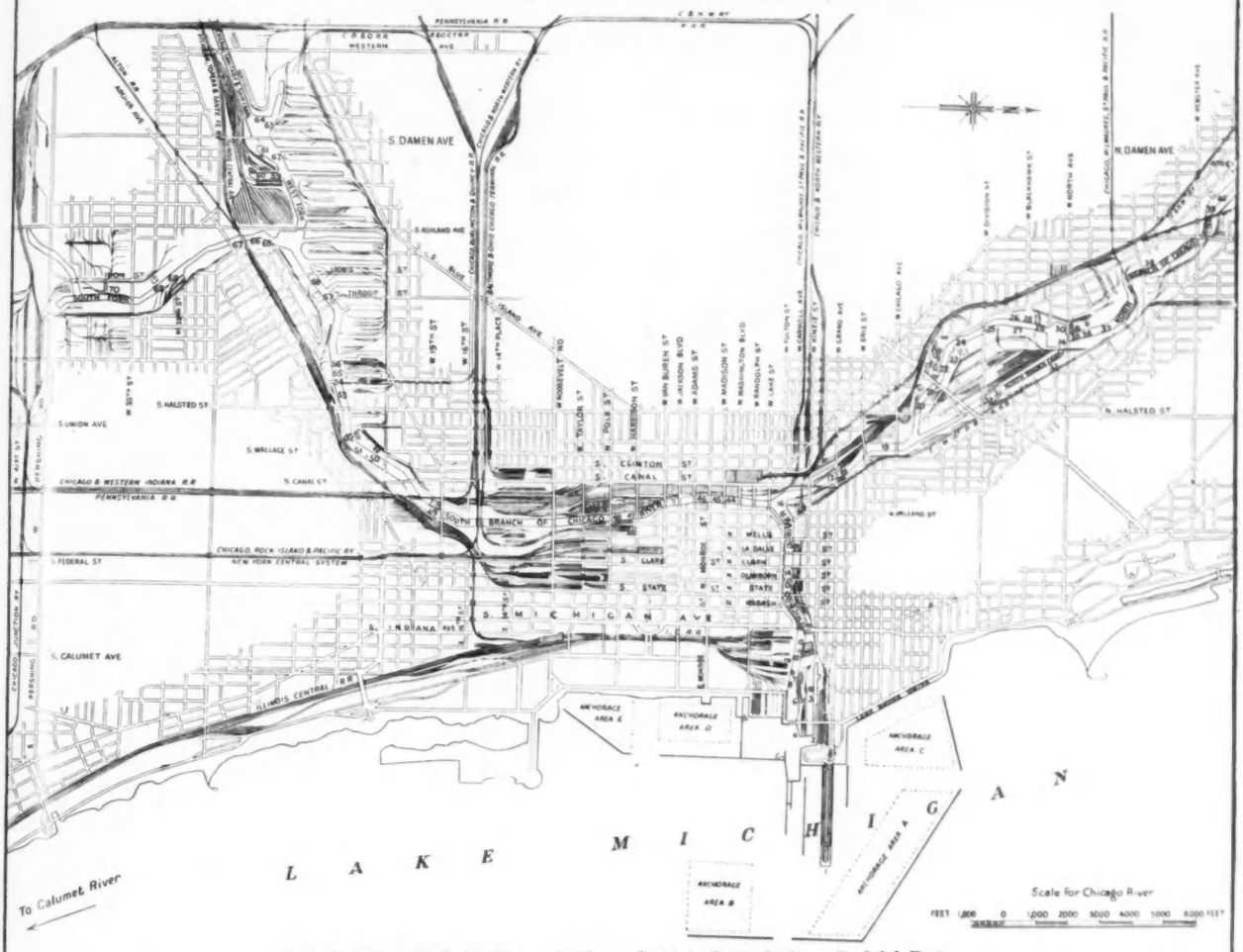
(b) An exterior breakwater enclosing an outer basin of about 490 acres in extent, the breakwater being in three sections, exclusive of gaps, as follows: The shore extension at the north end built of timber cribs and 2,200-ft. long; the main exterior breakwater built of timber cribs and 5,413-ft. long; and the southerly extension built of rubble mound and concrete caissons and 5,000-ft. long, exclusive of the harbour entrance gap of 500-ft.

(c) Maintenance dredging to a depth of 21-ft. (low-water datum for Lake Michigan) of that part of the inner basin lying north of a line drawn eastwardly perpendicular to the eastern boundary of Grant Park, from the northern end of said boundary, and also of the entrance to Chicago River from the lake to Rush Street over a width varying from 470 to 190-ft.

Chicago River.—Up to the early nineties improvements were made by the City of Chicago and riparian owners, the Government having restricted its work to providing a safe entrance to the river as far as Rush Street. The original project, adopted by Congress in the act of June 3rd, 1896, provided for 16-ft. draught throughout the river. The act of June 13th, 1902, added to the project a provision for two turning basins, one in the North Branch and one in the South Branch, to be dredged to a depth of 21-ft. The existing project, authorised by the River and Harbour Acts of March 3rd, 1899, and March 2nd, 1907, and completed in 1914, provided for maintenance dredging to 21-ft. below the hydraulic grade line corresponding to low-water datum in Lake Michigan of the main river from Rush Street to the junction of the North and South Branches; the North Branch from the junction to North Avenue; the North Branch Canal; and the North Branch turning basin, to within 20-ft. of existing docks.

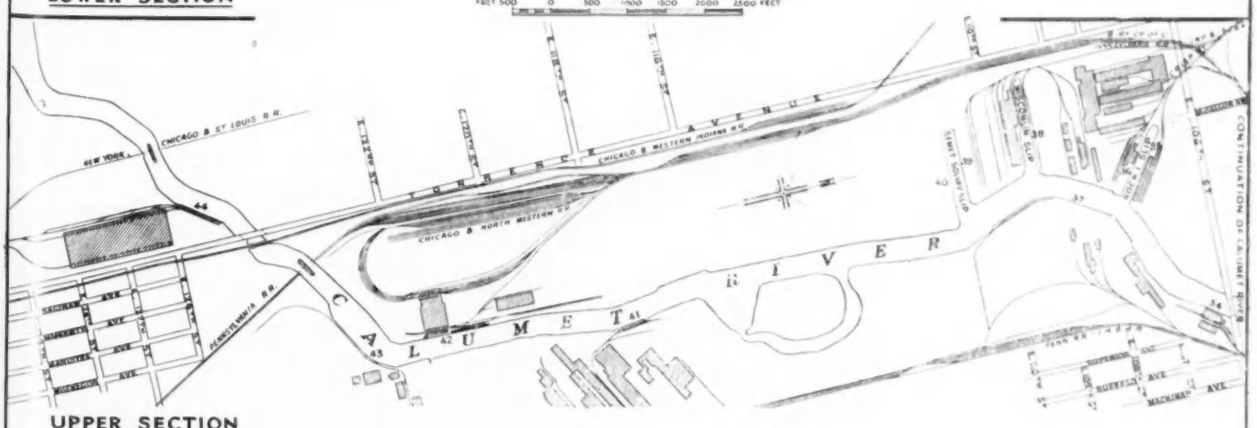
Calumet Harbour and River.—Before improvement by the United States, Calumet River, while having a navigable channel about 200-ft. wide and 13-ft. deep for a length of about 4 miles, could not be reached from the lake by boats of over 4-ft. draught because of the bar across its mouth. The lower end of the river paralleled Lake Michigan and entered the lake about 3,200-ft.

PORT OF CHICAGO



FACILITIES AT CHICAGO RIVER

LOWER SECTION



UPPER SECTION

FACILITIES AT CALUMET RIVER

Port of Chicago —continued

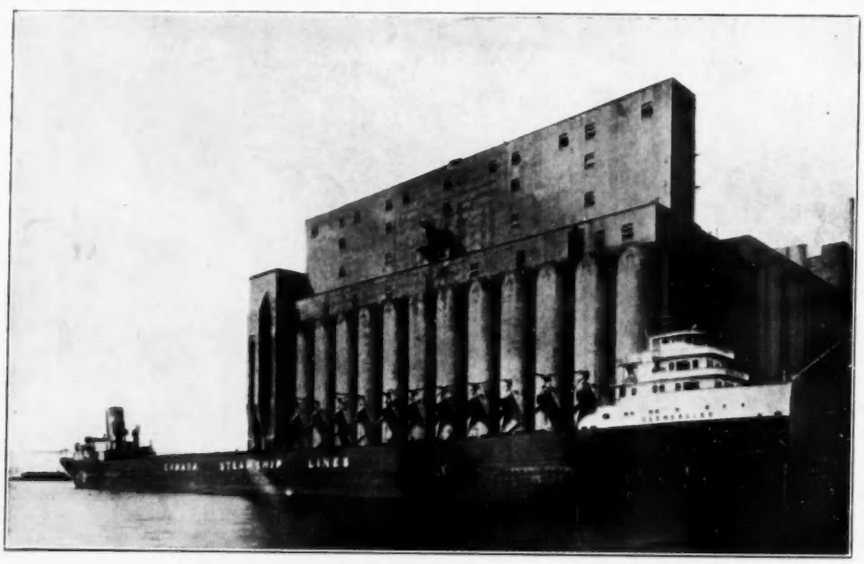
south of its present entrance. Under the River and Harbour Act of July 11, 1870, and modified by the Act of August 11, 1888, a cut was made through the bar, thereby providing a new and straightened mouth for the river; piers were constructed at the north and south sides of the new river mouth and a 16-ft. channel, 200-ft. wide, was dredged between them.

The existing project, adopted by the River and Harbour Acts of March 3, 1899; June 13, 1902; March 3, 1905; June 25, 1910; March 2, 1919; September 22, 1922; and August 30, 1935, provided for the following work:

(a) An outer harbour protected by two breakwaters, one (timber cribs) extending 4,400-ft. due east from the shore, thence south-easterly 2,500-ft.; and the other a detached breakwater extending about 5,000-ft. south-easterly with an entrance 600-ft. wide between the breakwaters.

(b) Dredging the outer harbour area to a depth of 26-ft. with a minimum width of 3,000-ft.

(c) An entrance channel to the river 26-ft. deep between existing bulkheads to the Elgin, Joliet & Eastern Railway Co. bridge near the original shore line.



View of Chicago and North Western Elevator, Calumet River (9,000,000 bushel capacity).

(d) A channel in Camulet River, thence to The Forks, with a minimum width of 200-ft. and with a depth of 25-ft. to the Semet Solvay wharf, near One Hundred and Eleventh Street; a depth of 23-ft. through the rock section in the vicinity of One Hundred and Eleventh and One Hundred and Fourteenth Streets, thence a depth of 21.5-ft. to the head of the improvement.

(e) Widening and straightening the river channel, except through the rock cut, to lines 20-ft. from the bulkhead lines now or hereafter established.

(f) Five turning basins at intervals along the channel, of suitable size for turning the largest lake cargo carriers, and each of the same depth as the adjacent channel.

The items of work contemplated under the existing project have been completed with the exception of deepening parts of the outer harbour and the Calumet River to One Hundred and Eleventh Street, widening and straightening the river and construction of turning basins Nos. 2 and 4. The work in the river awaits compliance with conditions precedent as stipulated in the Acts of March 3, 1905, and August 30, 1935.

Lake Calumet.—Under a project for "Lake Calumet, Ill.", adopted by the River and Harbour Act of August 30, 1935 the city of Chicago has provided by ordinance for a suitable lake-and-river terminal and transfer harbour at the southerly end of Lake Calumet and the United States has dredged initial areas.

Public Terminal Improvements

Chicago Harbour, Ill.—The only municipal terminal at the port of Chicago is the Navy pier, located north of the mouth of the Chicago River. This pier is 292-ft. wide, and extends into the lake for a distance of 3,000-ft. The freight sheds on the dock level have a combined area of 468,000 sq. ft., which is leased to various steamship lines for 35 cents per sq. ft. The floor space on the second level of the pier has an area of 317,300 sq. ft., which is leased for 20 cents per sq. ft. The receipts and shipments consist mostly of package freight. It is not equipped with freight-handling devices and has no rail connections.

The State of Illinois has completed a public barge terminal. Provided with rail connections and a freight shed at Damen Avenue on the south side of the West Fork of the South Branch of the Chicago River, at the junction with the Chicago Sanitary and Ship Canal.

Calumet Harbour and River.—There are no publicly owned or operated terminal or trannfer facilities on Calumet Harbour and River. The approved harbour plan of the city of Chicago contemplates the construction of an interstate terminal and transfer harbour at the State line with piers extending into the outer harbour basin. There appears to be no prospect of immediate action on the project.

Lake Calumet.—The City of Chicago has provided by ordinance for a suitable lake-and-river harbour terminal and transfer harbour at the southerly end of Lake Calumet.

Ownership of Water Front

Chicago River.—The ownership of the water front is divided between the Commissioners of Chicago Park District, the City of Chicago, the Illinois Central Railroad Co., and various private owners. A frontage of about 14,000-ft. is provided in the Chicago River (including the entrance channel east of Michigan Avenue Bridge) to the junction of the North and South Branches. Along the North and South Branches of the Chicago River there is a total frontage, including slips, of about 125,000-ft., about 25,000 of which is used for terminal purposes. The only portion of the river frontage used by navigation and owned by the City of Chicago is located on the south side of the river between Michigan Boulevard and Lake Street. The frontage on the South side of the West Fork of the South Branch of the Chicago River on the west side of the Santa Fé Railway slip has been acquired by the State of Illinois. Public ownership and control of terminal faiclities on the Chicago River and its branches is negligible.

Calumet Harbour and River.—The terminal facilities on the lake front at Calumet Harbour up to the Elgin, Joliet and Eastern Railway Co.'s bridge are owned and operated privately. The United States Lighthouse Reservation is located on the north side of the entrance channel. The docks along the Calumet River are operated by various private and industrial companies handling ore, coal, grain, and construction materials.

Port Administration

There is no single constituted port body at Chicago, but rather a group of more or less disassociated bodies that function under State laws and city ordinances in matters pertaining to the development and maintenance of port facilities.

Apart from the jurisdiction and control generally exercised by the Federal Government over navigable waterways, the local powers' action upon port matters is as follows:

The State of Illinois, through its department of public works and buildings, has jurisdiction over all rivers and lakes of the State and requires that no work of any kind in any of the public waters of the State shall be done without the approval of the department. It provides continual inspection of the shore lines of Lake Michigan and Chicago River to see that no enroachments are made, and to fix shore and harbour lines. At Calumet Harbour, the department must approve the sale or lease of any of the lands granted to the city, and has power to insist that the harbour be maintained in accordance with the plans submitted.

The city council of Chicago has authority, granted by the State Act of June 23, 1913, to acquire, own, construct, maintain, and operate anywhere within the jurisdiction or limits of the city, or in, over, and upon any public waters bordering thereon, such harbours, canals, slips, wharves, docks, levees, piers, quay walls, breakwaters, and all other harbour structures, facilities, connections, and improvements as are required. It has the power to lease any of its harbour facilities under terms to be fixed by ordinance, and to acquire by purchase, unconditional gift, or condemnation any or all property necessary or appropriate for any of the purposes enumerated in the Act.

Under the State, Cities, and Villages Act of 1925, the city council has power to construct bridges; to deepen, widen, or alter the channel of water courses; to licence tugs and other boats used about the harbour; to make regulations regarding the use of harbours; opening and passing of bridges; and to appoint harbour masters and define their duties. The city is also given jurisdiction over all waters to the extent of 3 miles beyond the city limits.

Such powers of port control as the city now possesses are exercised by the city council through its various committees and bureaux and by the department of public works. The commissioner of public works, appointed by the mayor, has especial charge and superintendence of all bridges, docks, wharves, public landings, and of all works for widening, deepening, or dredging of the Chicago River and its branches and of the harbour. The harbour master, also appointed by the mayor,

Port of Chicago—continued

exercises control of the harbour under the supervision and direction of the commissioner of public works. The duties of the harbour master include the exercise of police power to carry out regulations established under city ordinances for the government of the harbour, operation of bridges, prevention of enroachment upon existing dock lines, supervision of repairs to docks,* inspection of the condition of docks with a view to keeping them in proper repair, prevention of the dumping of refuse, regulation of the movement of vessels, inspection of dredging and dumping operations to protect the water supply, and the issuance of permits for construction work in navigable waters.

The Chicago Park District has power to extend the parks, boulevards, and driveways over and upon the bed of public waters, submerged lands, or navigable rivers bordering on such parks. It also has the power to release lands bordering or penetrating into any public waters to the city for wharves, slips, docks, breakwaters, etc.

View of Chicago River, State Street Bridge in Foreground.

The Sanitary District of Chicago is a State Board having power to dispose of the sewerage and drainage of Chicago and environs, including the construction, deepening, widening, or straightening of one or more drainage channels, as well as building bridges thereover and of constructing and controlling docks thereon.

In addition to the formally constituted bodies above referred to, numerous civic organisations have exhibited interest in various phases of the port problems and have assisted in promoting improvements.

Pilotage and Towage

Pilotage is not required at the port of Chicago. Towage service is not compulsory but is required by many vessels.

Dockage

Chicago Harbour.—Dockage charges depend entirely upon agreements made between vessel and dock owners. The City of Chicago leases space in the transit sheds on the commercial section of the Navy pier on a yearly rental basis. Rates vary, depending on the location, but are approximately 20 cent. per square foot per year for space in the south shed and from 10 to 20 cents per square foot per year for space in the north shed, these rates providing for the exclusive use of the dock and the wharf opposite the area, with no other charge against the ship or the cargo except for electric current or water. On the open or recreational section of the pier, pleasure boats are charged seasonal rates, depending upon the carrying capacity of the boat, as follows: $100 for each boat with a capacity of not exceeding 20 passengers; $150 for each boat with a capacity of from 21 to 50 passengers; $200 for each boat with a capacity of 51 to 100 passengers; and $300 for each boat with a capacity exceeding 100 passengers. The dockage or moorage charge for vessels laid up out of commission during the winter season is usually less than $1 per running foot.

Calumet Harbour and River.—During the winter a large number of like freighters tie up at docks along the Calumet River, there being frequently as many as 75 vessels using the river for this purpose. Most of the docks are privately owned, and a charge is made, depending upon the length of the vessel, usually less than $1 per foot per season.

*In American nomenclature, largely synonymous with pier or wharf areas.

Wharfage

Chicago Harbour.—There is no published schedule of wharfage rates at the Port of Chicago. The charges for storage space at the Navy pier vary from 20 to 35 cents per square foot per year, depending whether the space is on the dock level, or the second level of the pier. Located on the north side of the Ogden Slip is the North Pier Terminal, where the charges for space vary from $4\frac{1}{6}$ to $7\frac{1}{2}$ cents per square foot per month. Wharfage may also be obtained at the Railway Terminal Storage Co., located on the North Branch of the Chicago River and Grand Avenue, where the charges are about the same as at the North Pier Terminal.

Calumet Harbour.—The only wharfage facilities for public use of any importance are those owned by the South Chicago Coal and Dock Co., and the Crooks Terminal Warehouses, Inc. The former company has modern equipment to unload and store bulk cargoes, such as coal, ore, sand and gravel. No schedule of rates is published for this service, as the charge depends upon the amount of the material and the length of time stored. The Terminal and Transportation Co., of Illinois, has facilities for handling and storing both bulk freight and package freight. There is no published schedule of rates for this service.

Lighterage

The Merchants' Lighterage Co., located in the Hibbard, Spencer and Bartlett Building near the Michigan Avenue Bridge on Chicago River, engages in the lighterage of package freight for railroads, steamship lines and mercantile establishments between the mouth of Chicago River to North Avenue on North Branch of Chicago River, and to Twenty-second Street on the South Branch.

To steam barges are operated by this company, one being $114\frac{1}{2}$-ft. long and the other $99\frac{1}{2}$-ft. long, of 190 and 138 net registered tons respectively. These vessels have low superstructures and can clear all but two of the bridges within the zone of operations. The charges for the service rendered by this concern are as follows:

	Cents per 100 pounds
Package freight requiring rehandling in carload lots between docks (minimum carload weight as per Illinois classification)	.06
Package freight in less-carload quantities, handled with other deliveries	.09½

Loading and Discharging Vessels

Chicago Harbour.—The Navy pier, the only public terminal at Chicago Harbour, is not equipped with freight-handling devices, and has no railroad connections. The unloading of material is done by manual labour. The various sand and gravel companies having storage yards located along the branches of the Chicago River utilise locomotive cranes and belt conveyors for unloading their material.

Calumet Harbour.—Very little miscellaneous cargo is handled at the harbour, practically all shipments consisting of bulk cargoes.

Labour.

Under an agreement between the International Longshoremen's Association, Local No. 19, and local employers, the basic working day for all classes of labour is 8 hours and the normal working week is from Monday at 7 a.m. to Sunday at 7 a.m. The basic hourly rate of pay for day work, between 7 a.m. and 6 p.m., is 80 cents, and for night work from 6 p.m. to 7 a.m. and for lunch periods, 90 cents. The basic hourly rate of pay for Sundays and holidays is 95 cents per hour, said holidays to be Sundays, Memorial Day (May 30th), Fourth of July, Thanksgiving Day, Christmas Day, and New Year's Day, and such other holidays as may be decreed by statute or presidential proclamation, provided that no work of any nature shall be done on Labour Day. Labour required to handle cargoes of alfalfa feed, barbed wire, hides, potash, soda ash, sulphate of ammonia, and other cargoes of a similar character, is paid 95 cents per hour for day work and $1.05 per hour for night work. On Sundays and holidays the hourly rates for this kind of work are $1 for day work and $1.10 for night work. For operating winches and conveyances the rate is $1.05 per hour for day work, $1.20 per hour for night work, and $1.25 per hour on Sundays and holidays.

PORT AND HARBOUR FACILITIES

There are 114 wharves or terminals at the Port of Chicago, of which 70 are situated on Chicago Harbour and River, and its branches, and 44 on Calumet Harbour and River.

Chicago Harbour and River.—Of the terminals on Chicago Harbour and River, 12 are located on Chicago Harbour, 4 on Chicago River, 27 on the North Branch, and 27 on the South

Port of Chicago—continued

Branch. Sixteen of these wharves are used for handling general cargo, 12 are for the receipt of sand and gravel, 10 for handling coal of which 2 engage in bunkering, 5 are in connection with grain elevators, and the remaining 27 are used for various other purposes. The majority of the wharves are of the timber bulkhead type with solid earth fill in rear, and have water depths ranging from 10 to 21-ft. at low water datum, with a few exceeding that depth. Most of the wharves have railroad connections.

The municipal pier, known as Navy pier, situated on Chicago Harbour at the foot of Grand Avenue, is 3,000-ft. long and 292-ft. wide. There are two 2-storey buildings with an 80-ft. driveway between, extending nearly the entire length of the pier. The lower storey of the building on the south side is used for transit-shed purposes by the steamship lines berthing on that side, while the lower storey of the building on the north side is occupied mainly by dealers and manufacturers of recreational craft. The upper storeys of the building are available for conventions and exhibition purposes. The outer 600-ft. of the pier is used entirely for recreational purposes.

The North Pier Terminal Ca. has a wharf frontage of 1,540-ft. with a water depth of 16-ft. at low water datum alongside on the north side of Ogden Slip near the mouth of the Chicago River. Package freight is received at this terminal for warehousing and further distribution. It is served by the Chicago and North Western Railway and the underground transportation services of the Chicago Tunnel Co. The terminal company also has a 200-ft. wharf on the south side of Ogden Slip, as well as a 250-ft. wharf on the north side of Chicago River near its mouth, both of these wharves having warehousing facilities in rear. Still another terminal operated by the North Pier Terminal Co. is situated on the West Fork of the South Branch at the entrance to the Chicago Sanitary and Ship Canal, where general merchandise and bulk commodities such as steel, lumber, sulphur, pig iron, etc., is transferred to and from inland waterway carriers. There is a total berthing space of 2,360-ft. at this wharf.

Calumet Harbour and River.—Calumet Harbour and River in South Chicago is the industrial waterway of the Port of Chicago. Of the 44 wharves or terminals on the waterway 11 are operated by iron and steel industries for the receipt of iron ore, limestone, and coal; 10 are in connection with grain elevators; 5 for marine repair plants; 4 for receipt of sand and gravel; 1 for general cargo in foreign and domestic trade; 1 for coal bunkering; and the remaining 12 for other purposes. Crooks Terminal Wharf is used regularly by vessels of the Great Lakes Transit Corporation and the Canadian Pacific Great Lakes Line. The wharves are concrete or timber bulkheads, and in some instances steel sheet pile, with solid earth fill in rear, the water depths, alongside ranging from 10 to 26-ft. at low water datum. Practically all of the wharves have railroad connections.

Hoisting Facilities

The hoisting facilities at Chicago Harbour and River are locomotive and tractor cranes, and stiff-leg derricks, with lifting capacities ranging from 5 to 50 tons. The machine of the latter capacity is a revolving stiff-leg derrick with a reach of 80-ft., at the wharf of the Keith Boat and Engine Co. on the South Branch at Halstead Street Bridge, where 750-ft. of berthing space is available with 17-ft. of water alongside at low water datum.

At Calumet Harbour and River the hoisting facilities consist mainly of travelling straight-line and bridge cranes which are used to unload bulk commodities such as iron ore and coal. These machines can handle from 100 to 500 tons per hour. The American Ship Building Co. has a 50-ton shear-leg derrick at its plant situated above and adjacent to One Hundredth Street Bridge. The maximum vertical lift is 40-ft. The berthing space at the derrick is 900 linear ft., and the depth alongside is 21-ft. at low water datum.

Grain Elevators

Chicago is one of the grain ports on the Great Lakes, and has a total elevator capacity of 28,970,000 bushels, representing the facilities of 14 elevators. Nine of these are located on the Calumet River, and 5 on the Chicago River. All of the 14 elevators are equipped for unloading from and to cars, 13 are equipped for loading to vessels and 7 for unloading from vessels.

The largest unit in the port is the Chicago and North Western Railway elevator on the Calumet River operated by Cargill, Inc., which, with its annexe, has a storage of 9,500,000 bushels. There are 1,200 linear feet of berthing space with 18 to 21-ft. of water alongside at low water datum. The facilities of both the elevator and its annexe include 7 spouts for loading to cars, 13 spouts for loading to vessels, 25 car pits for unloading cars, and 1 marine leg for unloading vessels. Six railroad tracks having a total capacity of 140 cars serve the elevator, and one 18-car track serves the annexe.

The various charges at the Port of Chicago for elevation, storage, cleaning, drying, weighing and inspection, are as follows (as of September, 1938): Elevation charges are 1 cent or 1½ cents per bushel, including 10 days, free storage, and loading of grain into railroad cars or vessels; storage after free time is 1 cent per bushel per month; cleaning and drying charges vary, the rate for cleaning usually being 1 cent per bushel, and drying 70 cents per 1,000 bushels; weighing charge, as made by the Board of Trade, for "coming out or into" vessels is 50 cents per 1,000 bushels; loading into cars is 90 cents per car, and unloading, $1 per car. Inspection charges as made by the State are $1.25 per car for "in or out" of railroad cars, and 95 cents per 1,000 bushels for "in or out" of vessels.

Storage Warehouses

The Port of Chicago is well provided with storage warehouse facilities to handle the diversified commerce of the port. The warehouse establishments considered in this report are those which handle or are potential handlers of commodities carried in the water-borne commerce of the port, while those catering to the storage of furniture or household effects, and automobiles, have been excluded. Transit sheds, which at times take on the nature of warehouses, have also been excluded.

Of the 51 warehouses described, 39 are for dry storage, 11 for cold storage, and 1 for both dry and cold. Nine of the establishments are situated on the water front and have facilities for the direct transfer of cargo from and to vessels, while a great majority of the others are located in more or less close proximity to the water front. With few exceptions, the warehouses in the port are provided with railroad sidings.

The warehouses have an aggregate storage space of 9,773,937 square feet, or 110,633,123 cubic feet, of which 2,854,255 square feet or 28,317,269 cubic feet are for cold storage purposes.

Aerial view of Calumet Harbour and River.

Dry Docks and Marine Railways

Chicago Harbour.—There are no dry docks in Chicago Harbour or River. The Marine Motor Shop and Boat Yard operates a 50-ton marine railway in connection with its plant for the repair of recreational and harbour craft on the North Branch of the Chicago River near Oakley Avenue. The yard of Henry C. Grebe and Co., Inc., also operated for the repair of small craft, is located on the North Branch above Belmont Avenue, and is equipped with a 125-ton marine railway.

Calumet Harbour.—There are two graving and two floating dry docks on the Calumet River. The former are operated by the American Shipbuilding Co. at its yard on the east side of the river above the One Hundredth Street Bridge. The graving docks are 500 and 727-ft. long, with depths on the keel blocks 14.6 and 15.6-ft. at low water datum. One floating dry dock 95-ft. long with a lifting capacity of 450 tons is operated by the Calumet Ship Yard and Dry Dock Co. on Howard slip, and another 130-ft. long with a lifting capacity of 1,500 tons is operated on Turning Basin No. 1 by the Great Lakes Dredge and Dock Co. The latter is for private use only.

The charge for use of the graving docks is 75 cents per foot of length for docking vessels under 500 gross tons register. For vessels over 500 tons, the charge is 20 cents per ton up to 2,000 tons and 10 cents for each additional ton above 2,000. In addition to the above, there is a pumping charge of $50. For lay time, the charge is 30 per cent of the docking charge per day for vessels up to 500 tons, and 9 cents per gross ton per day for vessels over 500 tons. Minimum charge for lay time is $50 per day.

On the floating dry docks, the charge for docking is 75 cents per foot of length, minimum charge, $75. Other charges incidental to docking are, pumping $35, and setting blocks $25. The lay time for floating dry docks is $15 per day per vessel.

COMMERCE.

The water-borne commerce of the Port of Chicago comprises the traffic on Chicago Harbour, Chicago River and its branches, Calumet Harbour and Calumet River. The last two are indus-

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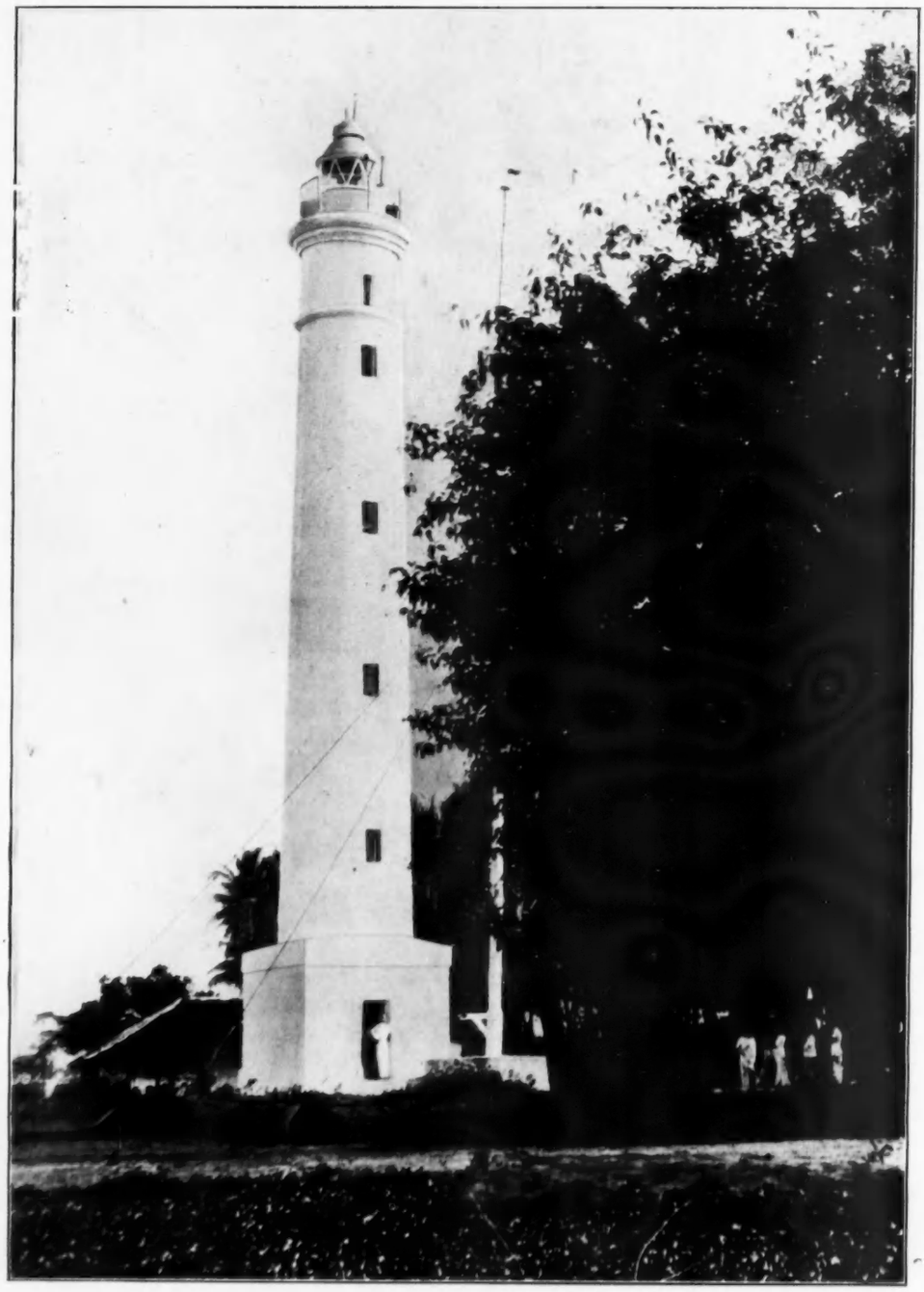

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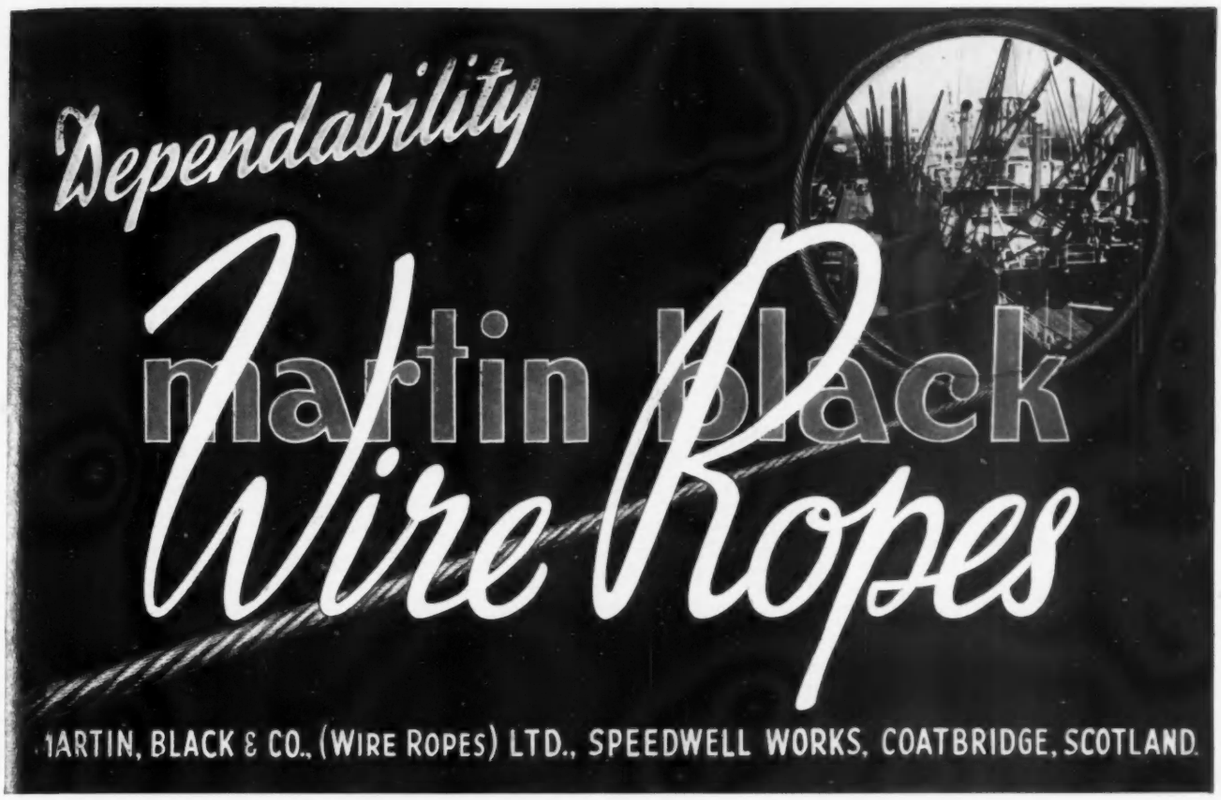

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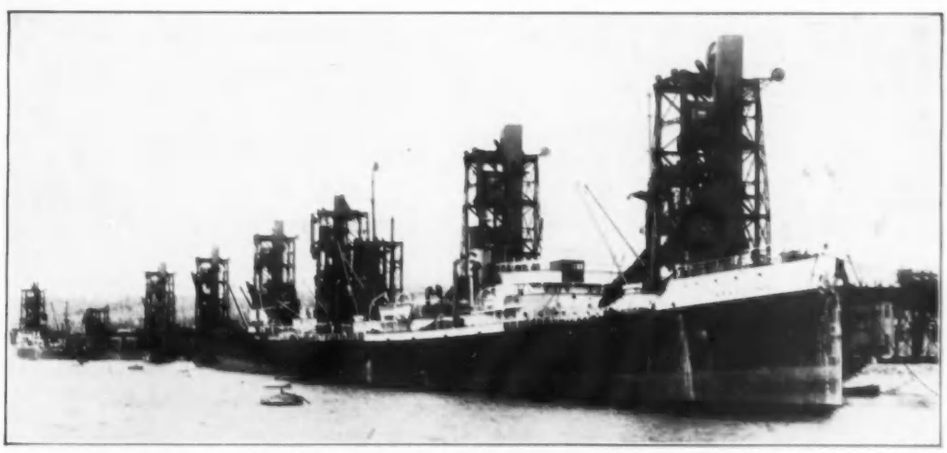

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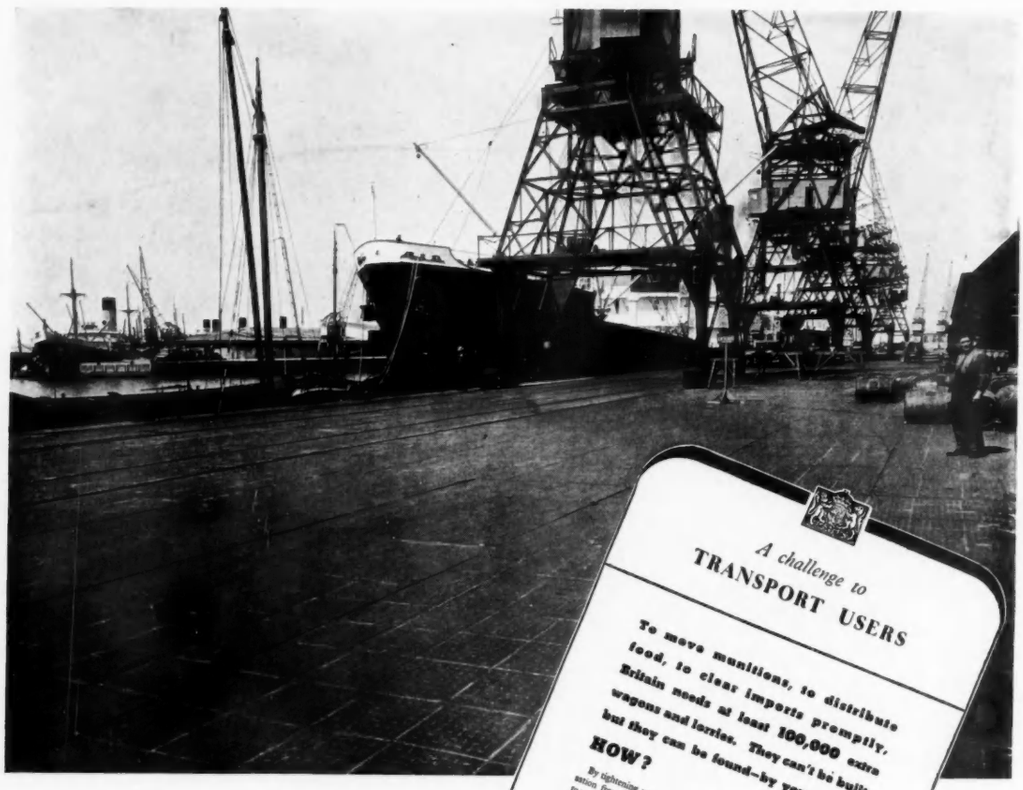
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Port of Chicago—continued

trial waterways of the port which traverse the south section of the city where are located the iron and steel industries, as well as most of the grain elevators. The traffic on these waterways consists largely of the movement of iron ore, coal, limestone, grain and sand and gravel. The commodities carried in the traffic on Chicago Harbour and River, where the mercantile and warehousing facilities are centred, are more diversified in character, including such as newsprint paper, sugar, petroleum products, wood pulp, flour, feed, etc.

The average annual volume of commerce of the port during the 10-year period 1929-1938 was 11,997,442 tons. The peak of this period occurred in 1937 when 18,612,301 tons were handled, while the low point, in 1932 accounted for 5,246,014 tons.

Imports

The imports at Chicago are mainly from Canadian ports on the Great Lakes, although there is some overseas traffic as well which moves via the Welland Canal and the St. Lawrence River. Prior to 1932 the statistics of the port did not show a segregation of these two types of foreign trade, but since that year available records show that an average of 11 per cent. of the volume of imports is in overseas traffic. There was a pronounced increase in the annual volume of imports through the years 1932 to 1937 inclusive, with a marked decrease in 1938, caused in part by a decrease in receipts of foreign grain.

The average volume of import traffic during the 10-year period was 366,323 tons, or 3.1 per cent. of the total water-borne traffic of the port, of which newsprint paper comprised 37.9 per cent. and grain 35.4 per cent. Other items in the order of their volume were sand, wood pulp, sugar, flax seed, glass and iron and steel scrap. The receipt of newsprint paper is the most consistent item in import traffic and the general trend in the volume handled annually is upward. The volume of this commodity received in 1929 was 85,093 tons, increasing to 180,109 tons in 1937. In 1938 the receipts dropped to 156,586 tons. It has been received almost entirely from Canadian lake ports.

Exports

The annual volume of exports from Chicago fluctuated throughout the period 1929-1938, ranging from a low of 11,898 tons in 1931 to 1,602,845 tons in 1938. The comparatively large volume moved in the latter year was due to the shipment of 1,392,280 tons of corn to Canadian lake ports. The largest previous annual movement of corn to Canadian ports during the period amounted to 135,044 tons. An average of 7.1 per cent. of the total exports of the port moved in overseas traffic.

The average annual volume of exports during the 10-year period was 282,227 tons, or 2.3 per cent. of the total water-borne traffic of the port. The principal item was grain, which accounted for 75.6 per cent. of the total exports. The movement of grain to Canadian ports was not uniform during the period, there being no shipments of this commodity during 1931 and 1935. Other important commodities in the export trade of the port were coke, soya beans, iron and steel products, sand, and soya bean meal and oil. The export movement of soya beans, and soya-bean meal and oil from Chicago is of recent origin, the first shipment of record having been made in 1935.

Lakewise Receipts

Lakewise traffic is that which moves between United States Great Lakes ports. Lakewise receipts at Chicago during the 10-year period under consideration averaged 8,530,246 tons annually, representing 71.1 per cent. of the total average annual water-borne traffic of the port, and consisted mainly of bulk commodities. Iron ore represented 52.6 per cent. of the average lakewise receipts, coal was 24.2 per cent. and limestone 12.6 per cent. The movement of these three commodities into the port is constant, though varying in volume from year to year. The average volume of iron ore received during the 10-year period was 4,487,457 tons. The greatest amount received in any one of the 10 years was 8,781,690 tons in 1929, and the smallest 381,263 tons in 1932. Receipts of coal in any one year did not vary greatly from the average.

Lakewise Shipments

The outstanding commodity in lakewise shipments was grain, which averaged 1,004,063 tons annually during the 10-year period, and represented 67.2 per cent. of the total. The lakewise shipments of the port constitute 12.4 per cent. of its total water-borne traffic.

Internal Receipts

The internal traffic of the port is that which moves to and from Chicago and interior points via the Illinois Waterway, which connects with the South Branch of Chicago River through the Sanitary and Ship Canal, and with the Calumet River through the Sanitary and Ship Canal, Calumet-Sag Channel, and little Calumet River. The Illinois Waterway extends via the Illinois River to its junction with the Mississippi River at Grafton, Ill.

The internal receipts at Chicago averaged 712,032, tons annually during the period 1929-1938, representing 5.9 per cent. of the total average annual water-borne traffic of the port. The general trend of the volume of this traffic throughout most of the decade has been upward, reaching its peak in 1938 with 2,461,041 tons. Sand and gravel and petroleum products moved in considerable quantity in this traffic throughout the 10-year period, and coal and grain as well as other commodities in lesser volume since 1934.

Internal Shipments

The internal shipments at Chicago averaged 27,801 tons annually during the 10-year period, though there was no movement in this traffic prior to 1933. The principal commodities involved were sand and gravel, rolled forms of iron and steel and grain.

Local and Intraport Traffic

The local intraport traffic of the port, consisting mainly of the movement of sand and gravel, averaged 584,271 tons annually during the period, and represented 4.9 per cent. of the total average annual water-borne commerce of the port.

National Dock Labour Corporation

First General Meeting

The first ordinary general meeting of the National Dock Labour Corporation, Ltd., was held in London at the close of December under the chairmanship of Mr. R. T. Garrett.

Reviewing the activities of the Corporation during the first three months of its existence, Mr. Garrett said that before the scheme was submitted to the Ministry of Labour the first step was to prepare a draft scheme and while that was the duty of the Local Joint Committee of the port, it also meant that the staff of the Corporation was kept busy dealing with the many difficult and doubtful points which inevitably arose. The second step was reached only when a scheme was finally drafted. It was then closely examined before being transmitted to the Ministry, where it once more underwent detailed and expert criticism. Only after passing those tests was it finally approved. Nor was approval an end of the matter, for before a scheme could be applied the organisation necessary for its working must first be established in the port. That meant setting up a local board, finding a manager and the necessary staff, establishing offices and control points, and planning and providing the accounting system to deal with the manifold problems of weekly pay.

The staff problem was important because, on their success in solving it, depended to a very large degree the ultimate and permanent success of the undertaking and of the Minister's Order. Their new and complicated organisation must have the right men to direct and manage it; such men were not easily found. They had to persuade the dock workers of the country to accept a great change in the conditions to which they had always been accustomed, and being a conservative body of men they did not take readily or kindly to innovations. They had to be persuaded to accept a measure of control, and being, like most Britons, of a marked independence of character they were apt to book askance at systems of control. They had to be convinced that the Order gave them a square deal to persuade them to give the country a square deal in return. The Order conferred great benefits on the dock workers, benefits which they had sought for many years. In return they were asked to accept some limitation of their freedom to move or to stay put, and of their choice to work, or not to work, according to their inclination. It was obvious that if the scheme was to be fully successful it must secure the good will and whole-hearted co-operation of the men. Difficulties were bound to crop up in the early days. They were trying to establish the Corporation as an efficient and economical organisation and they regarded their responsibility in handling moneys derived from the industry and the Government as a very serious trust. Self-interest provided the most powerful of all incentives to economy But it should be remembered that true economy consisted in spending wisely when it was wise to spend, no less than in saving wisely when it was wise to save. It did not consist in curtailing every form of expenditure, or in saving a ha'porth of tar at the risk of spoiling the ship.

Obituary

The Port of Newport, Mon., has recently lost one of its prominent citizens in the person of **Mr. Arthur Wentworth Heard**, who has died at the age of 76. Mr. Heard had held the chairmanship of the Newport Harbour Commissioners on several occasions.

The death took place towards the close of 1941, of **Mr. Alexander Shamberg,** a Commissioner of the Port of New York Authority since 1930. Mr. Shamberg displayed great interest in the promotion of bridge and tunnel projects across the River Hudson and was largely responsible for the execution of the Lincoln Tunnel, being chairman of the committee in charge of the work.

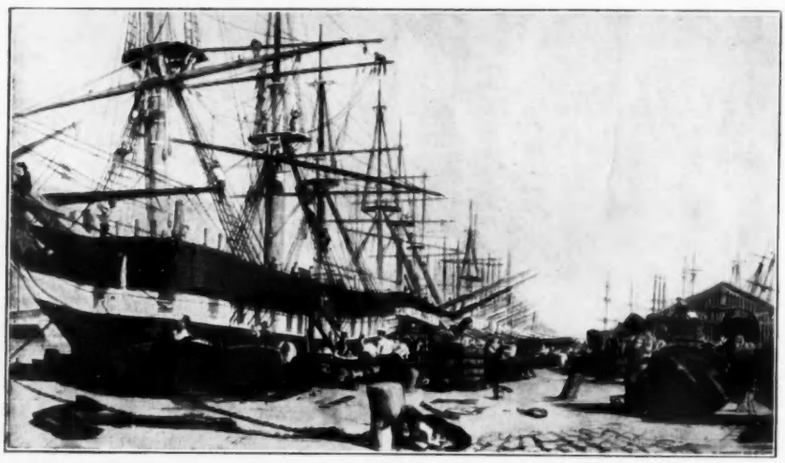
London Dock Labour in Olden Days

By FRANK C. BOWEN.

Dock labour is attracting a good deal of attention from the general public at the present time, as it has always attracted attention from the commercial community, and it is interesting to cast back into the past and to see how the present problems were tackled by the most highly organised dock labour in the country, that of the Port of London. It is clear that our forefathers had to face the same problems of pilferage and bad conduct, but they also had the same very big element of highly-skilled, self-respecting labour which deserved the highest praise just as it does to-day.

Guild of Fellowship Porters

The most ancient and highly respected body of dock labour was the Guild of Fellowship Porters, which was not finally dissolved until 1894, and of which there are still one or two pensioners. From the very earliest days of incorporation the City of London had the right of handling all goods imported into or exported from the port, and in order to protect their rights and good name, porters were appointed for the purpose; their fees were laid down publicly and nobody was allowed to interfere with their work. This system was very valuable to the port in its primitive state, and its value was acknowledged by various charters. The Guild of Fellowship Porters was incorporated in 1155, in the reign of Henry II., and in their early days they had the monopoly of the porterage business within the city limits, which then included all the wharves on the riverside.



A particularly fine engraving showing the West India Dock more than a century ago.

In 1302, the rates for measuring and handling corn at Queenhithe were laid down and it was ordered that the measurer should have the assistance of eight master porters, each with three Fellowship Porters under him, and that each porter should find a horse and seven sacks for the work. The corn trade, brought into London by coasting vessels, was then one of the most important and the monopoly was of great value to them as well as being a safeguard to the city. As the trade developed their importance increased and in the early days many of them were substantial men and freemen of the city. The Guild was reincorporated by James I. in 1613.

Porters of Billingsgate

Corn was not the only commodity in which they had a monopoly; they were the only people who had the right to carry and house salt, coal, fish and all fruit. In its prime in the early seventeenth century, the Guild numbered 3,600 members, but it did not escape from the jealousies and quarrels of the growing port, any more than the Watermen's Company and others. In 1619, following bitter disputes with other bodies, the Common Council of London ordered that the corn and salt porters were to continue as one company, to be called the Porters of Billingsgate. and that their number was to be increased from 120 to 400. At that time, it should be remembered, Billingsgate and the various quays and drawdocks all had their particular trades. These porters were ordered to elect twenty-four of the "sagest, discreetest and meetest" of their members to be assistants, and at Midsummer each year they were to elect six persons of substance as rulers and governors. It was confirmed that nobody outside the company should unload any vessel at Billingsgate, with a penalty of twenty shillings, half of which was to go to the company's funds and half to the poor children of Christ's Hospital. Although Billingsgate was not entirely concerned with fish at that day, the fish trade was growing and they found it a profitable branch. Later, the number of rulers was reduced and a governor, deputy-governor and deputy-of-ward acted as superintendents. The members wore badges to identify them like the watermen.

An Act of Parliament in 1646 gave the company power to elect its rulers, but one of these was always appointed by the City Corporation, and the porters were under the control of the Aldermen of Billingsgate; the City Corporation invariably protected them from any attempt to interfere with their monopoly, regarding it as an attack on their own sacred privileges. It also looked after their dignity, as shown in 1779 when one of the Fellowship Porters was taken bythe Press Gang, whose action was confirmed by a magistrate. The Corporation took the matter up and the magistrate was fined £100.

The Porters of Billingsgate were only one case in which sections broke away to a greater or lesser extent, but they still remained Fellowship Porters, and just as often as they separated they returned to the parent body. At one time it aspired to become a livery company of the City, but this seems to have aroused considerable opposition among the more powerful companies and the scheme was dropped. The fact that it was ever considered at all shows the position which the porters held, and they were fully conscious of this.

There was no doubt that this feeling of dignity made a very big difference to the reputation of the Port of London, in an age which was certainly not famous for its honesty.

The growing trade of the port in the eighteenth century, when the city wharves proved themselves quite incapable of dealing with the traffic, naturally led to a curtailment of the Guild's monopolies, but they retained them as long as they could and a large part of the trade still remained in the Pool. The Fellowship Porters' Hall was situated for years in St. Mary-at-Hill, next door to the Watermen's Hall, and later in Beer Lane. Well into the middle of the nineteenth century members of the Guild had to attend Divine Service at the Church at St. Mary-at-Hill in Lower Thames Street, later headquarters of the Church Army, on the Sunday before Midsummer's Day. A great feature of the service was that all members and their families carried nosegays and that the members marched up the aisle two by two to deposit on the altar their alms for the poor of the district. It was quite a social event, like the annual service of Trinity House at St. Olaves, and a large number of merchants, with their families and servants, also attended. The Guild supplied nosegays to these non-members on the Saturday night, putting aside twenty pounds per annum for their cost. By the nineteenth century, however, they had dropped to be the second body in the port, the premier place having been taken by the Ticket Porters through their monopoly of the American trade and the popularity of St. Katherine's and the West India Docks.

As might be imagined in such an organised body, there were various grades of Fellowship Porters, with their respective nicknames. The senior men were called the "White Mice," or "Dandies," on account of the white coats which they wore when handling clean cargoes such as corn, malt, seed and ice. Their place of assembly and allocation of work was on Tower Hill. The "Dirties" handled coal, potatoes and fruit, and the "Smellies" salt fish and oil. Vacancies among the "White Mice" were filled from the lower grades.

Ships coming up the Thames signalled the number of porters that they required, and the quay at which they would dock, before they reached the Pool, and the supply of labour seems to have been very carefully organised. The men were certainly strictly supervised and disciplined in every respect and there appears to have been no trouble in maintaining this discipline; fines or even expulsion from the Guild were the recognised penalties.

Any misconduct or pilferage was immediately visited by punishment, and at the enquiry into river piracy and pilferage in the port which was held in 1796 it was shown that there was very little pilferage by the Fellowship Porters, although there was any amount by other sections of the waterside community and it was not unusual for a ship to lose 25 per cent. of her cargo. Fees charged were strictly limited and every member was bound to be available for work at any time between 4 a.m. and 8 p.m. in summer; between 6 a.m. and 6 p.m. in the winter. An official of the Fellowship was always in attendance to see that the men worked honestly, with particular stress on preventing them from avoiding jobs which they considered unprofitable or unpleasant. This, it should be remembered, was the men's own choice by themselves.

Ticket Porters

The Fellowship Porters were not the only disciplined and organised body of labour in the river. The Ticket Porters, who were distinguished by the metal tickets they wore on their girdles,

London Dock Labour in Olden Days—continued

also came under the Corporation and were appointed by that body. An alderman acted as the governor of their society, and their discipline was as strict as that of the Fellowship Porters, although their organisation was different. In the early days they had the monopoly of all port work connected with pitch, tar deals, flax, hemp and other goods imported from the Baltic, and iron, ropes, greenwood, all Irish goods, most coastwise goods and cargoes from America. They also took the goods into the merchants' warehouses.

Each Ticket Porter had to enter into a bond, with two sureties of £100 each, that he would perform his duties faithfully. He was fined five shillings if he refused any work or left his job unfinished, being deprived of his ticket until the penalty was paid. There were numerous other fines for infractions of the rules or evasion of the charges laid down by the Corporation.

Tackle Porters

The Tackle Porters were a grade of Ticket Porters with the special task of weighing cargo, their full title being the Tackle-house Porters. They were appointed by the principal livery companies and not by the Corporation itself, having the monopoly of handling and warehousing all goods imported by the East India Company and the South Seas Company, and of all goods from parts not allocated to the Ticket Porters or Fellowship Porters. They had to enter bonds for £500 as security for their good behaviour and for their ability to make good any losses in the cargoes that they handled.

These three bodies did all the principal and most reputable work of the port, and there was little chance of outsiders breaking into their business. There was, however, plenty of other dock labour as the port grew and lumpers, coal heavers and warehouse labourers were constantly reported as being in league with the pilferers and river pirates, who ranged from the ships' crews to Custom House officers. The porters' particular job was to place goods conveniently for the night looters and to abstain from reporting anything that they saw. It was the prevalence of looting in the river which had the greatest influence on the construction of the first docks as fortresses against thieves, and the clipping of the City Corporation's privileges in the port. This clipping, in turn, penalised the organised porters who had done so much to check pilferage and to give faithful service.

For this reason the construction of the docks was strongly opposed by them, so that the Fellowship Porters, Ticket Porters and Tackle Porters finally amalgamated to have more strength for the purpose. The divisions between the various branches, and the demarkation of labour, were reduced, but the tide was setting against them, and in 1825 it was reported that the united bodies only numbered 3,000. Their average earnings were three shillings a day. In the 'seventies their membership had been reduced to 1,500, but when the Thames Conservancy was completely reorganised in 1894, taking over most of the remaining port duties of the Corporation, the Guild was abolished, although the Hall was not sold until 1907.

The Common Council's act of abolition ordered that the residue of the Guild's funds should be divided among the surviving members, causing a great deal of trouble, and most of the duties formerly covered by the Guild were undertaken by the Dockers' Union. When the funds were finally exhausted the City Corporation periodically helped the pensioners, latterly being greatly assisted by the late Lord Wakefield, who took a keen interest in them.

Madras Port Trust

Excerpts from Administration Report for 1940-41

Value of Trade.—The value of the total trade of the Port of Madras on private account as furnished by the Collector of Customs, representing 38 per cent. of the aggregate trade of the Presidency as against 39.87 per cent. in the previous year amounted to Rs. 2,859.12 lakhs or a decrease of Rs. 393.52 lakhs as compared with the previous year. Imports accounted for Rs. 1,394.93 lakhs and exports Rs. 1,464.19 lakhs as against Rs. 1,599.91 lakhs and Rs. 1,652.73 lakhs respectively in the previous year. Foreign traffic (imports and exports combined) decreased from Rs. 2,948.60 lakhs to Rupees 2,621.90 lakhs and coasting cargo from Rs. 304.04 lakhs to Rs. 237.22 lakhs. These figures are exclusive of Government transactions.

Receipts.—Excluding the sum of Rs. 1,114 being the net amount of engineering credits under " Suspense " during the year, the net revenue receipts for the year amounted to Rs. 31,08,410 as against Rs. 38,88,783 of the previous year. There was thus a decrease in receipts of Rs. 7,80,373 from those of the previous year.

Expenditure.—A sum of Rs. 17,904 has been debited to " Suspense " chiefly representing the value of engineering stores purchased during the year as an additional reserve stock. Excluding the above and also the contribution to the Renewals and Replacement Fund, the Accident Fund and to the Capital Account, the net expenditure for the year amounted to Rs. 26,85,882 as against Rs. 29,79,960 of the previous year.

Working Expenses.—The actual working expenses came to 56.76 per cent. of income as against 50.06 per cent. in the previous year.

Shipping.—The number of vessels that entered the harbour during 1940-41 was 500 as against 724 in the previous year and the total tonnage decreased from 2,571,738 to 1,654,532. The average tonnage of each steamer or motor vessel decreased from 3,610.15 to 3,493.35.

The Report is signed by the Chairman, Mr. G. G. Armstrong O.B.E.

Notable Port Personalities

XIX.—Mr. William Cuthbert, J.P.

Mr. William Cuthbert has been a member of the Clyde Navigation Trust since 1919. He was elected Deputy-Chairman in 1930 and Chairman in 1939 in succession to the late Mr. W. F. Robertson. He was Chairman of the Executive Committee of the Clyde Pilotage Authority for 10 years and has been its Chairman in alternate years since 1939. He is also Chairman of the Port Emergency Committee for Glasgow and Clydebank.

Mr. WILLIAM CUTHBERT, J.P.

All Mr. Cuthbert's business life has been spent in shipping. He joined his father in the Clyde Shipping Company in 1884, later became its Managing Director and subsequently its Chairman—an office which he at present holds. He is also a Director of the British and Continental Steamship Company, Limited, and of The Clydesdale Bank, Limited.

In 1904, Mr. Cuthbert was Chairman of the Clyde Steamshipowners' Association and President of the Shipowners' and Shipbrokers' Benevolent Association, 1914-1916. In 1938 and 1939, he was Lord Dean of Guild of the City of Glasgow.

Mr. Cuthbert is keenly interested in the welfare of sailors and their dependents, and takes an active part in the conduct of benevolent associations operating for that purpose.

Improvements at Turkish Ports.

The announcement has been made in Istanbul that a contract has been placed with Messrs. Braithwaite and Co. (Engineers), Ltd., London, for an extension of the berthage accommodation and the provision of additional cargo-handling appliances at the Turkish ports of Alexandretta (Iskanderan) and Mersina. At Alexandretta, a jetty, 500 yards long by 55 yards wide, is projected, with quay sheds, railway sidings and cranes. At Mersina, the existing partially constructed jetty is to be brought to completion. Both ports are connected by rail with the important town of Aleppo.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this Journal should not be taken as an indication that they are necessarily available for export.

Coastal Sandhills

Use of Marram Grass and Pine for Fixing and Stabilisation

By ERIC HARDY, F.Z.S.

On low sandy coasts the belts of coastal sand dunes near to harbours can prove of considerable nuisance to adjoining roads and buildings if the shifting sand and sandhills are not fixed. With a prevailing onshore wind and continuously increasing outer belts of sand brought down in river silt by the local estuaries, the sandhills tend to reach a maximum height of 80 feet, but in the case of barren dunes the wind can move such a sandhill as much as 40 yards in a night. The most economical method of fixing local sandhills is to plant them with marram or star-grass to bind and hold the tall, wind-blown dunes, to drain the hollows between them of their accumulated brackish water, and then plant a belt of young pines which will permanently fix the dune area. Examples of this may be seen on the coasts of Lancashire, Cheshire, North Wales, South Wales, the Firth of Forth and East Anglia.

Coastal Change in Sandy Districts

The effect of the wind upon barren sandhills is sometimes astonishing. In March, 1907, a high hill near Bedford Road, Birkdale, Southport, actually disappeared in a single night. Considerable expenditure of men, lorries and horses is sometimes required to move wind-blown sand from important roadways. Southport once had 40 men, horses and trollies working for weeks removing a sandhill to make a new road, but one night's wind carried it all back again. The least obstruction on the flat strand, like a blade of weed or a shell or a stone, only an inch high, will cause the wind-blown sand to accumulate around it and form the beginnings of a new sandhill. The foreshore owners at Formby, Ainsdale and Birkdale, on the Lancashire coast, continually planted hedges of brushwood on the shore so that the sand collected on the leeward side and added considerably to their holding of land. Star-grass or "sea-reed" (*Amrophila arundinacea*) has a wonderful power of holding wind-blown sand and checking its progress inland. Young plants should be planted on barren sand in autumn, winter or early spring, about a foot or two feet apart each way, and the area enclosed from visitors for a few years to enable the grass to establish itself firmly. It is a very deep-rooted plant, but there is no chance of it colonising dunes higher than 60 feet, which is about the limits of the suctional power of sand providing its roots with moisture. Its widely creeping root stock will in a few years bind the sand together, its stems grow 2 feet to 4 feet tall, the leaves closing up in dry weather, and if the outer dunes are fixed by this plant, the inner dunes can be levelled without fear of the work being undone. Dwarf or creeping willow *(Salix Repens)* can be used to form the first heath of the lowland sand, and young pines about five years old, or a minimum of three years, from a nursery plantation can be planted out in winter to form the pineweed protective belt. This is what has been done with the largest single tract of coastal sandhills in England, in the Formby area north of Liverpool, which, treeless in 1887, has had nearly 2,000 acres since afforested with Scots, Austrian and Weymouth pines, some Canadian poplar, abele, birch, alder and the most successful and abundant tree, Corsican pine.

Marram or Star Grass and its creeping rootstock in sand.

Before star-grass became so commonly used for sand-barriers on this coast, patches of small sandhills appeared and disappeared at intervals, the hills sometimes removing bodily inwards. A hill that has been deprived of its star-grass is eroded on its windward side, the sand being blown over the top and deposited a few yards distant on the leeward side, causing the hill to creep inland. Such an incident on the Lancashire coast caused a sandhill to creep 35 yards inland during five years and threaten the railway line. In those parts of the country where sandhills are used for wartime tank practice there is considerable danger of damage to the grasses and dwarf willows, resulting in shifting sandhills in the near future.

Consolidation Process

After the hills are fixed and settle down to their permanent positions, they begin to shrink in height, become consolidated with the aid of rain, and are not so susceptible to the wind effects. A hill of 30 feet may shrink so much as five or six feet in a few years. It is only when it is thus consolidated that it is suitable as a building foundation. The action of the star-grass and dwarf willow is not only to consolidate and bind the hills with their roots, but to hold back the blown sand with their foliage, causing it to fall near them instead of inland, so that the hill grows taller and they push up their stems through the new sand. But there is a limit to this upward growth of the sandhills: it averages 60 feet, but may sometimes reach 80 feet. This is due to the suction power of sand failing at about 60 feet, so that no moisture is available for plant life above that extent, when the engineering value of the plants ceases to function, except to hold the hill already accumulated. The sandhills are thus in layers at right angles to the prevailing wind, which generally means they are parallel to the coast and rarely on the inner side of a coastal range. Their leeward or inland growth is in a long slope in contrast to the sharp windward side.

Outer Sand Dunes held by Marram or Star Grass, Point of Air, North Wales.

Where sandhills are not fixed and wind-blown sand is allowed to reach buildings, it has a very expensive eroding effect; it cuts the faces of the bricks, cuts the mortar from between the bricks, cuts and frays the face of sandstone, causing it to fall away, and it is probably just as destructive as frost and rain. Its agricultural damage is also heavy. If the dunes are levelled and covered with a layer of earth, the sand will work its way upwards until the earth is gradually absorbed by the sand and lost, giving the false impression of more blown-sand accumulations.

On the South Lancashire coast a peculiar sand problem has been caused by the river Alt, which has cut away nearly two and a-half miles of sandhills in its long estuary down the coast at Blundellsands. It takes this dune sand into Liverpool Bay and the tides wash it up at Formby Point, where the wind blows it back on to the Formby-Southport dunes, hence their continual seaward growth. The main source of this little Sahara of sandhills on the Lancashire coast is not local, although the sea accumulates it, but from the millstone grit of the Pennines and the East Lancashire hills, like Parbold, eroded by the Mersey and Ribble tributaries. Four hundred years ago there were no sandhills on the South and West Lancashire coasts or the Cheshire coasts: they were peaty mosslands, as may still be detected under the sand on Hightown and Leasowe shores. The west Cheshire and Flintshire (North Wales) sandhills were accumulated when the Mersey entered the sea jointly with the Dee before it formed the Liverpool bottle-neck outlet after the submergence of the land. At the subsidence of the land the moss and mere coastline of the Lancashire fens was invaded by the sea, but then the formation of sandhills pushed back the sea. Most of the West Lancashire coast is now growing westwards as the sea recedes. The salt-marsh shore of the Ribble estuary between Southport and Preston has also crept seawards at a rapid rate with Ribble deposits during the past century, but this is mud, and it cannot be fixed by star-grass, which will not grow in mud, although Spartina grass has grown there. In the last 25 years the Bog Hole Channel, off Southport Pier, has filled up, and what was high-water mark on

Marram or Star Grass fixing Sandhills on Lancashire Coast, near Southport.

(*Concluded on page 69*)

The Port of Hong Kong

Report on Future Control and Development

By the late Sir DAVID J. OWEN.

(Concluded from page 44).

99. **Railway Development.**—As already mentioned, the railway undertaking has sufficient accommodation at the present time, but if and when things settle down in China, the question of more facilities for the railway is bound to arise.

It has been suggested to me that the railway station is not in the best position and the plan attached shows an alternative site. If additional wharf accommodation is to be provided to the northward of the Hong Kong and Kowloon Wharf and Godown Company, as previously suggested, then it might be that the needs of the railway could be met without constructing any pier to the east of the Peninsula of Kowloon as proposed by Messrs. Coode and Company, but a berth is shown on the plan attached. The railway should, however, be connected with any new pier on the west and the necessary sidings provided, as also shown on the plan attached.

The reconstruction of the railway station might well be left over for consideration at some future time.

100. **Ferries.** Under the policy suggested in paragraph 83, sub-section (j) the piers of the Hong Kong and Yaumati Ferry Company would still be maintained by the Government, the ferry company paying a suitable annual sum for the privilege of running their ferries, while the leases of the piers used by the Star Ferry Company would be renewed, subject to the payment of a suitable annual sum. The question as to the amount of that payment can, no doubt, be settled by negotiation with the Company.

A point however arises in connection with the Star Ferry Pier at Kowloon. The existing site is not quite suitable and is congested, hence an idea has been put forward to build a new pier as shown on the plan attached. This scheme has much to favour it, but it might well be left over for consideration at some future time when the congestion becomes greater.

The scheme of reclamation between the junction of Queen Victoria Street with Connaught Road and the junction of Murray Road with Connaught Road, already referred to, when carried out will displace the Star Ferry Company's pier at the end of Ice House Street. In this case the same policy as for other piers should be applied. The Harbour Trust could construct the new ferry pier or the Ferry Company could do so themselves, as might be negotiated, the rent being fixed accordingly.

With regard to the Jubilee Street ferry pier which is used by the Yaumati Ferry Company for their vehicular ferry service, it appears that the existing service is becoming unable to cope adequately with the great number of vehicles that desire to cross the ferry at times. This leads to delay and congestion to traffic in the vicinity, which would be intensified by any growth in the passenger traffic. Coupled with this is the fact that in the event of extensive repairs being required to the existing pier a stoppage of the service might occur. Further the present pier is in a somewhat exposed position which makes it difficult to handle the vehicular ferry boats at certain states of the tide, especially when a north-easterly wind is blowing. The ferry company are alive to all this and the remedy they propose is the provision of another pier for the vehicular service adjoining each of the present ones. On the other hand, it has been suggested that it would be better if the new pier were placed in another position—at Marsh Road, Wanchai, for a service to run from there to a pier to be constructed at Gillies Avenue, Hung Hom. This would have the effect of dissipating the traffic. The ferry company prefer their own proposal as they state the other idea would make the service more costly to run seeing that it would involve more ferry boats.

Taking everything into consideration, I am of opinion that it would be more advantageous in the public interest if a new pier for the vehicular ferry service were provided at Marsh Road, together with one on the opposite side of the Harbour at Gillies Avenue (both of which sites are less exposed to westerly winds) notwithstanding any extra cost of operating the services. The proposed piers are shown on the attached plan.

It has been pointed out to me that objection to a second pier adjoining the present one at Jubilee Street has been made by the owners of Douglas Pier, on the ground that the berthing of their ships would be rendered more difficult. Whatever may be the merits of this complaint, the difficulty would not arise if the suggested position at Marsh Road were adopted for the ferry pier. The difficulty of the Douglas Company in any case would be disposed of if the development recommended in paragraph 88 were carried out.

The proposed pier opposite Marsh Road would incidentally have the effect of affording some protection to the western entrance to Causeway Bay from heavy seas caused by westerly gales. The provision of such protection has been under consideration for some years, but before any additional measures in this direction are taken the effect of the pier should be observed.

101. **Sewerage.**—I have refrained from dealing with the general question of sewerage, as it hardly falls within the terms of my reference. In suggesting (paragraph 97 (a)) the filling in of the present Typhoon refuge harbour at Mong Kok Tsui, I am aware that, apart from its other advantages, such reclamation will have the effect of clearing away an area of still water heavily polluted with sewage. There are other places in the Harbour which are similarly affected, and it seems to me that sooner or later the system now in force of discharging crude sewage into the waters of the Harbour will have to be abolished at certain places, and a more modern method substituted. This is a matter relating to the health of the community and forms a big problem to which I have no doubt the Government is fully alive. It is a problem which has arisen in many other Ports of which I have had experience.

102. **Summary of Recommendations.**—I would briefly summarise the various recommendations made in this Report:—

(1) That a Body to be called the " Hong Kong Harbour Trust " be established as soon as possible. (Paragraph 83 (a)).

(2) That the constitution of the Trust be as under:—

Three Government officials of high standing, to be appointed by the Governor.

Three British subjects connected with the trade of the Port, to be appointed by the Governor on the nomination of the General Chamber of Commerce.

One person interested in the trade of the Port to be appointed by the Governor on the nomination of the Chinese Chamber of Commerce.

One independent Chairman, being a person of business experience and, if possible, with a knowledge of Port affairs, to be appointed by the Governor on the nomination of the other members of the Trust at a meeting duly held for the purpose. (Paragraph 83 (b)).

(3) The Harbour Trustees, other than the Chairman, to be unpaid, but the Chairman to be paid a suitable annual fee. (Paragraph 83 (c)).

(4) This Body of Harbour Trustees to remain in being for three years as an experiment. (Paragraph 83 (d)).

(5) The matters over which the Trust would have control to be:—

Leasing or letting of piers.

Construction of new piers as and when necessary, and the charges therefor.

Lights and buoys (Navigational), and the charges therefor.

Mooring buoys, and the charges therefor.

Ferries, and the royalties, etc., therefor.

Dredging the Harbour as required from time to time.

Licensing of Pilots.

Regulation of Harbour traffic and the promulgation of the necessary by-laws for this purpose.

The general policy of the Harbour. (Paragraph 83 (e)).

(6) The rents of the piers, the charges for the use of mooring buoys, the charges levied upon the ferry owners in the form of royalties, etc., and the light dues to be paid to the Trust. (Paragraph 83 (f)).

(7) No charges or rents to be levied by the Trust without the consent of the Governor thereto having been first obtained. (Paragraph 83 (g)).

(8) The necessary staff for the working of the Trust to be supplied by the Government from their official establishment, for the experimental period of three years. (Paragraph 83 (h)).

(9) The Trust to regulate its own procedure with the proviso that a quorum at any meeting should be four, and no Trustee to be allowed to vote on any question directly affecting his own or his firm's business. (Paragraph 83 (i)).

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(10) The policy to be adopted by the Trust to be that of seeing that adequate and proper facilities are available in the Harbour for ships and their cargoes, but to allow approved private enterprise to provide these facilities as far as possible and also to let private enterprise do its own operating. (Paragraph 83 (j)). This would involve the renewal of the piers leases which expire in 1949 (except in those cases where new piers would be provided, which would require special treatment as mentioned in paragraph 89), and the issue of new leases as occasion arose.

(11) Every future lease should stipulate that the lessee is to use the pier only for the purpose of his own business, and that no sub-letting is to be allowed. (Paragraph 83 (j)).

(12) A statement of the receipts and expenditure of the Trust to be published annually. (Paragraph 83 (k)).

(13) During the experimental period of three years, any surplus of revenue over receipts to be paid over to the Government and any shortage to be recouped by the Government. (Paragraph 83 (l)).

(14) At the end of the experimental period of three years, if the Harbour Trust is found to function satisfactorily, it should be established on a permanent basis, with the same constitution and duties, subject to any modification that may be deemed to be desirable in the light of the experience gained. (Paragraph 83 (m)).

(15) That Connaught Road from its junction with Queen Victoria Street to its junction with Queen Street be widened by reclamation and 13 new piers constructed in lieu of the existing piers which would be demolished; and that a reclamation, with new piers in front, be made from the junction of Connaught Road with Queen Victoria Street to the junction of Connaught Road with Murray Road. All this is shown on the attached plan. The cost of the reclamation and of any piers for Government use, to be borne by the Government, but the cost of the other piers to be borne by the Proposed Harbour Trust. (Paragraphs 88-90).

(16) That negotiations be entered into for the removal of the Royal Naval Depôt from its present position on the west side of the Kowloon Peninsula to some other suitable site. (Paragraph 92).

(17) In due time, when the ocean-going trade of the Port expands to such an extent as to require further accommodation, the Hong Kong and Kowloon Wharf and Godown Company to be encouraged to provide more pier and Godown accommodation to the northward of their present premises on the west side of the Kowloon Peninsula, the Naval Depôt having, it is assumed, been by then removed. The question should also be considered of providing transit sheds, passenger accommodation and railway sidings on any new piers constructed. The railway connections would necessitate taking over the Military lands south of Austin Road and moving the Military elsewhere. (Paragraphs 92-93). A tentative scheme of new piers in that locality is shown on the attached plan.

(18) That the work of reclaiming land from the waters of the Harbour be undertaken by the Government and not by the proposed Harbour Trust. (Paragraph 96).

(19) That it is desirable for the Government to carry out the following works of reclamation as soon as practicable:—

(a) Filling in the present Typhoon refuge harbour at Mong Kok Tsui (167 acres) and filling in about 143 acres at Cheung Sha Wan, together with the formation at the latter place of a new Typhoon refuge in lieu of the former. (Paragraph 97 (a)).

(b) A small reclamation at Yau Tong Wan in order to accommodate ship and boat building yards that would be displaced at Cheung Sha Wan. (Paragraph 97 (b)).

(c) About 214 acres at Tsun Wan (Paragraph 97 (c)).

(20) That a reclamation at Ngau Tau Kok, adjacent to the area at Kun Tong now being slowly reclaimed by the dumping of town refuse, be included in the programme of development for carrying out at such time as circumstances indicate, with road and rail connections as required.

(21) That consideration be given to the possibility of removing the Air Port to some other place say in the New Territories, in order to avoid so costly a reclamation scheme as would be necessary to enable the Air Services to develop at their present site.

(22) That a removal of the railway station at Kowloon from its present site, to a more suitable site, as shown on the attached plan, be considered at some suitable future time.

(23) That in due time when the traffic increases to such an extent as to justify it, a new vehicular ferry service be established with a pier opposite Marsh Road, Hong Kong and another pier opposite Gillies Avenue, Kowloon.

Thanks

103. I should like, in conclusion, to express my warmest thanks to:—

(a) The many Government officials with whom I have come in contact, for all the information and assistance which they have so willingly given to me in the course of my enquiry.

(b) To members of the commercial community who have freely expressed their views and supplied me with valuable information.

(c) To all, both Government officials and members of the business community, who have extended to me and Mr. Kennedy the most kindly hospitality.

(d) To the Government for their hospitality and the excellent accommodation they placed at the disposal of Mr. Kennedy and myself, which made our stay in the Colony a very pleasant one.

Finally, I should like to acknowledge my indebtedness to Mr. Kennedy, for his valuable service and assistance throughout the enquiry.

I have the honour to be,

Your Excellency's obedient servant,

24th February, 1941. DAVID J. OWEN.

Sir David Owen's Report having been brought to the notice of Mr. John Duncan, M.Inst.C.E., formerly Port Engineer of Hong Kong, the following interesting communication has been received from that gentleman. It will be recalled that Mr. Duncan's recommendations for the future development of the Port were published in the issues of this Journal for April and May, 1926:—

To the Editor of "The Dock and Harbour Authority"

Port of Hong Kong

It is indeed the irony of fate that whereas in 1924, the peak year of the colony's prosperity, I had the honour of advising the Government of Hong Kong on the commercial development of that great port; now in 1942, when that beautiful Colony with its excellent natural harbour, second to none, including even that of Sydney, after heroic resistance, has fallen to the Japanese, I feel impelled by the report of the late Sir David Owen to make comment on the same subject.

Conditions in 1924 and 1941

For many years prior to 1924 commercial interests had been clamouring for developments to meet more adequately and efficiently the needs of the Colony's growing trade. The problem was a difficult and complex one, not only because of the many competing, and in some cases conflicting, interests of peoples of different nationalities, but one further complicated by political considerations, of which—whilst the Government may be fully acquainted—the man interested in his own commercial business may be quite unaware. The following remarks will serve to illustrate this point:—

I am fully acquainted of the fact that economic and political conditions in 1941 were vastly changed from those obtaining during a year or two prior to 1924, the peak year of the Colony's prosperity. Advisedly, I use the word " prosperity " for, coincident with a record return in 1924 of shipping and goods tonnage entering and leaving the Port, there was a tremendous boom in land values; and why? Because China, even at that late date, was still undergoing the process of regeneration caused by the overthrow of the Manchu regime in 1911 and, in consequence, internecine strife was rampant throughout the whole country. Coincident with these unfortunate conditions, foreign political intrigue was active—particularly in South China—exploiting China in its unfortunate state, but really directed against British interests in the Far East. That was during the presidency of the late Dr. Sun Yat Sen—but I must not dilate further on this theme, otherwise the Censor will intervene. Enquirers may well say: What has all this to do with engineering matters? Much; for the result was a great increase in the Colony's population seeking safety and security, many of whom would elect to remain permanently. There was such a flow of money into the Colony that the banks almost refused to accept it and when they did so, they paid little or no interest for it placed on deposit account. The result was a boom in land values, which, together with the increased population, affected very much the question of reclamation work and the provision of all public services, including such work connected with harbour development as ferry piers. It, therefore, behoved anyone dealing with the subject under review to give much consideration to the possible effect of political influences which may affect the problem. Fortunately, as it happens, I did so in 1924, for, as events subsequently proved, political influences had repercussions of a very unfortunate character in regard to

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the trade of the Port. I can now admit publicly that in 1924 I had secret information from Chinese sources—which proved to be well founded—that a General Strike or boycott was planned for 1925, and, unfortunately for Hong Kong, it so happened. It was cunningly planned to take place just before Settlement Day in June of that year. Shipping was held up and commercial operations were not merely incommoded, but for some time practically suspended. Then the Colony received a setback, from which cause, followed by world-wide depression, the trade of the Colony has never recovered. In point of fact it has gone from bad to worse. Hence the reason why in 1924—to quote Professor Middleton Smith, M.Sc., M.I.Mech.E. (Taikoo Professor of Engineering in the University of Hong Kong—now retired) who, in his article which appeared in the December, 1936 issue of *The Dock and Harbour Authority*, aptly and correctly interprets my advice—I advised the Government to " hurry slowly " with works recommended by me for the physical development of the harbour. Nevertheless, I have great hopes for the future prosperity of Hong Kong. Given permanent peace and more equitable conditions of life, the problem under review—expurgated of such unfortunate political influences and provided goodwill and mutual trust exist between all concerned—will then be resolved into the simple one of control, economics and, so far as engineers are probably more interested, Physical Development. I agree with Professor Middleton Smith that " whatever the political future of Hong Kong may be, its geographical position and its wonderful harbour give it an almost unchallengeable future as the most important port in South China." Mr. Churchill in his address to both Houses of the Canadian Parliament on 30th December last, goes even farther when he describes it as " the greatest port of shipping in the whole world." It must and will always remain, at least, one of the largest ports in the world. We do not know what conditions exist in Hong Kong to-day. Even if we did, it would not avail us one iota for, if the Japanese should adopt the scorched-earth policy before they are driven out of Hong Kong, the whole matter, as your editorial comment says, " may well call for fresh consideration at the close of hostilities " and so, at the present time " the various proposals have little more than academic significance."

The Report of 1924

I was unaware of the report presented by the late Sir David Owen last year. That report I have now read with much interest, but before proceeding to express my opinions on his recommendations for administrative control and physical development, I must make an assumption and acquaint your readers with my recommendations in 1924, so that fair comparison may be made. There can then be frank and open discussion on the subject.

I cannot imagine for one moment that the Government would withhold from Sir David Owen any reports and recorded information in its possession, relevant to the subject on which his advice was sought, so I am going to assume that he received a copy of the report which I presented to the Government in 1924.

One naturally refrains from drawing attention to any eulogistic comment on, or criticism of one's own work, but, having regard to the fact that no reference whatsoever has been made to that report, which, if I may say so, was comprehensive, based on years of experience in Hong Kong, intensive study, and exhaustive research, I may perhaps be pardoned, if, under the circumstances, I first refer to one or two press comments on it.

On December 30th, 1924, editorial comment—all much on the same lines—was made in: *The China Mail*, Hong Kong; *The Hong Kong Daily Press*; and *The Hong Kong Telegraph*; and at later dates in other newspapers in the Far East and elsewhere. This is what *The China Mail* said:—

> " Historic is the only term that can describe the report presented by the Colony's Port Engineer, Mr. John Duncan, M.Inst.C.E., on the commercial development of our harbour. For historic it is in many ways. The Colonial Secretary said yesterday that a more interesting and important document has seldom been laid before the Council. Sir Claude Severn could have gone further without overstating the case. He could safely have said that the report may prove the most important document in the Colony's history, for, upon the commercial development of the harbour, as everyone knows, depends the future prosperity of the whole Colony. Other harbour reports there have been in the past, but they have all been so much tinkering with the problem. Even the late Sir Maurice Fitzmaurice dealt with only one aspect of the matter—the providing of wharves to meet Kowloon's future needs as a railway terminus—which Mr. John Duncan's report, if it does not say so in as many words, shows to be the wrong angle from which to approach the problem, looking to the fact that the through railway from the North is not likely to be completed for many years and anyway the bulk of the colony's trade will always be waterborne. . . . . "

In all fairness to the late Sir Maurice Fitzmaurice and his firm, then Messrs. Coode, Fitzmaurice, Wilson and Mitchell, Consulting Engineers to the Crown Agents for the Colonies, I would here interpolate that the matters on which his firm's advice was sought in 1920 were:—

1. Improvements of the harbour generally.
2. The provision of wharves and warehouses provided with railway communication.
3. Improvement of the Mongkoktsui Harbour of Refuge.
4. The question of dredging plant generally; the refitting of the dredger *St. Enoch* being considered in this connection.
5. The best means of providing facilities opposite Statue Square for landing from, or embarking on launches and small craft generally.

The consulting engineers adhered strictly to the terms of reference, which did not require them to deal with anything but engineering issues. In consequence, their report practically resolved itself into one dealing with the provision of wharfage, by the construction in the bight of Hung Hom Bay of a reclamation of 48½ acres from which were to project in a southerly direction a series of six jetties.

In the April and May, 1926, issues of *The Dock and Harbour Authority* a succint resume of my report was presented for the information of your readers and in your editorial of the latter issue you refer to it as:—

> " a very lengthy document embodying the result of a great " deal of painstaking research and containing a considerable " amount of valuable information on all phases of the " problem. . . . "

It will perhaps be conceded that at least in some quarters, the information contained in that report was considered of some value. But, if Sir David Owen considered it of little or no value, I submit that he would have added more to the solution of the problem by adverse criticism, rather than by eschewing all reference to it. In point of fact, he almost denies its existence, for, does he not say in paragraph 68:—

> " It may further be noted that there does not seem to have " been much in the nature of planning for the future develop- " ment of the Port. . . . "

That statement is quite incorrect, for, apart altogether from the plans prepared by my staff on my instructions, I might here ask: What about—

1. The plans of Jetties and Reclamation at Hung Hom Bay and of extensions to Mongkoktsui Breakwater prepared by Messrs. Coode and Co.
2. Plans of Wet Dock at Kowloon Point proposed by Captain W. Davidson, marine superintendent of the Canadian Pacific Railway Co.
3. Plans for Wharfage and Reclamation at North Point recommended by the late Mr. T. L. Perkins, C.M.G., Director of Public Works.
4. Plans of a Passenger Depôt at Victoria, proposed by Mr. Robert Sutherland, M.B.E., o/c Shipping Department of Messrs. Jardine, Matheson and Co.; and
5. Plans for the Development of the Harbour Front in General, recommended by The Hong Kong Town Planning Committee.

I do however agree with Sir David Owen that there " has been no officially adopted plan of development."

I trust your readers will not interpret any criticism I have to make as being made in any captious or cavilling spirit, for such is far from my mind. I had a great interest in the development of the harbour of Hong Kong. If in any way I can assist towards the most satisfactory solution of the difficult problem under review, then I shall feel happy in having accomplished something. One regret we all have, is that Sir David Owen has passed away; and so we shall not have the benefit of such reply as he may have felt disposed to make on any of the conflicting opinions which, apparently, have been already expressed on his report.

Whereas the Government's instructions to me in 1924 were limited:—

> " to prepare and submit for the consideration of the Govern- " ment a complete scheme for the Development of the Port."

I note that the terms of reference given to Sir David Owen were extremely wide; even to the extent of taking into account political conditions at a time when the Colony was threatened with war.

Nevertheless, and fortunately as it happens, I considered it my bounden duty to take into consideration all influences: political, economic, or physical, which, in my opinion, had any bearing whatsoever on the question of the future control and development of the Port.

Proposed Port Administration

For the information of your readers I would now draw their attention to the " Policy, Control, Management and Administration which I recommended should be adopted by the Government."

> " In my opinion, a properly-constituted Advisory Port " Authority, Board, or *Impartial Tribunal* is the first need."

(May I here draw attention to a printer's error in Professor Middleton Smith's article wherein he states that I was emphatic

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in recommending "a properly-constituted Advisory Port Authority, Board, or *Imperial* Tribunal?"

"To enable the Government to appraise intelligently the needs "of the Port, the Board should study and observe traffic and "port conditions, and advise and make recommendations as "to whether the results of these studies indicate the desir- "ability of greater channel accommodation, by deepening the "fairways; the provision of berthage, increased storage "space, road and railway transport facilities; change in the "disposition of buoys, lights, etc., modification of the tariffs; "or advice in any matters which concern the efficient working "of the Port.

"Whilst I have obtained much information to enable me to "prepare this report, the various Schemes of Development "are recommended with some reserve as the information "available is insufficient, from which to deduce with any "degree of accuracy the nature and extent of actual require- "ments. In the light of further information the various "schemes may require to be modified in detail . . . . the "programme of Port Development works to be constructed "by the Government in the near future must necessarily be "limited to the amount of berthage, which there is no doubt "would either become immediately remunerative, or the re- "turn of the cost be assured by the disposal of land reclaimed "in connection with its construction. Otherwise, to secure a "return on the capital expense involved in the construction "of berthage in excess of that taken up, would necessitate "either the levying of higher charges for the use of that "portion taken up or increased taxation on shipping. The "latter may not only result in driving away existing trade but "discourage new trade. The extent of the works recom- "mended for immediate construction is, therefore, limited "by these considerations.

"So far the development of the Port has been left to private "enterprise and adequate accommodation has not been made "for shipping. Without the provision of the most economic "handling and storage facilities possible, the present develop- "ments, together with the advantages of the security pertain- "ing to British Administration, the Colony's banking facili- "ties, and its excellent harbour, are unlikely to be sufficient "inducement for the producer to send forward his traffic so "that Hong Kong may deal with the trade its strategic posi- "tion should secure.

"Private companies, however, cannot be expected to meet "the cost of development works which are necessary to "secure true efficiency and economy in the handling of "cargoes, as the return on the capital cost is subject to trade "being handled over the works constructed. In this respect "it may be mentioned, that the Port derives little benefit "from the large transhipment business at Hong Kong on "through Bills of Lading. Nevertheless, private enter- "prise should be encouraged rather than abandoned. All "obstacles such as any marine and pier rights or other "domination of the waterfront in the way of creating modern "accommodation for shipping should be removed, if unable "to be co-ordinated in the general plan of developments.

"Port facilities are in the service not only of the Colony but "of South China, and indeed of the many ports with which "commerce is interchanged. The control of the Port itself, "and of port facilities, as well as all other matters relating to "the waterways, construction of quay accommodation, super- "vision of all port works under construction, and the general "maintenance, amelioration and extension of the accommo- "dation for the exploitation of the waters of the Colony, "should therefore be retained in the hands of the Govern- "ment.

"Since the shipping or Godown (warehouse) companies "themselves cannot be expected to initiate necessary reforms, "Government should put into operation such works as are "recommended, and such extensions as with the advice of "the Advisory Authority it is considered will best serve the "interests of the Port. The construction of the quays, "harbour roads, and the carrying out of all necessary dredg- "ing, should be undertaken by Government which would "lease the steamer berths to private operators on long term "leases. The junk basins, being as neccessary an adjunct "to transport as roads and railways and at the same time "providing shelter for small craft during typhoon weather, "should not be a charge on the lessee of the steamer berth.

"Private enterprise, however, should be required to provide "the shed, cargo-handling, and all other facilities.

"In regard to the granting of exclusive and particularly long "term leases for the use of the piers and wharves it would "seem well to observe some degree of caution. The recent "experience in America has been that such leases may result "in less efficient use of the facilities than is desirable for the "best interests of the Port. A lessee, for example, may keep "his wharf idle rather than permit its use by an actual or "potential competitor, or he may make such high charges as "to drive business away from the Port. This actually hap- "pened in New York during the 'Great War.' If leases are "made, they should preferably be in the form of first call on "the berth, Government reserving to itself the right, when the "berth is vacant, to assign to it vessels other than those be- "longing to the lessee, or in which he may hold a direct or "indirect interest.

"The basis of this Policy is that, while there would be the "broad *impartial* outlook of Government, which would pro- "vide the costly works and lease them in reasonable terms "for the exploitation of the Port, the administration of busi- "ness would be carried out by commercial people who should "be interested in despatch, efficiency, and economy, on the "method of Profit and Loss."

It will perhaps now be conceded that Sir David Owen's recommendations regarding Policy, control, management and administration are little different from those laid down in my report in 1924, the only difference being that he has elaborated them by going into a great deal of detail.

With so much information and advice on this subject as I know the Government already had in its possession, one is left to conjecture why it was considered necessary to seek further advice and so incur additional expense at a time when Great Britain was already at war and Hong Kong threatened! After all, the pier leases do not expire until 1949 and, in any case, if it was not found possible to adopt a complete scheme of control and form of development in the immediate future, the lessees could have been informed that their leases would be renewed for a period of say 10 years, which, I imagine, would have been sufficient encouragement for them to effect necessary repairs and improvements, the cost of which they could retrieve over a period of about 17 years.

Government Policy

Sir David Owen remarks that for years the doctrine of "laissez faire" has characterized the Government's attitude towards this question of control and development. To the uninformed it would indeed appear that the Government was disinterested. On the contrary, the Government, at any rate during the period of Sir Edward Stubbs' governorship (1920-1925), I do know was very conscious of the importance of the harbour—the very life-blood of the Colony. I venture to think that had conditions been more stable than they have been since the general strike in Hong Kong in 1925, and the Government been untramelled by political considerations, we should not now, in 1942, be discussing this subject, for the policy of control and development would have been decided long ago; and no doubt by this time many works would have been completed.

Does not the mere fact that a complete stranger to the Colony was asked to make recommendations "in the light of physical, economic, and *political* conditions" in 1941, lead one to conjecture whether political expediency dictated the Government's attitude, and so another report would assist appease for a further time importunate demands of people commercially interested in the development of the Port? If so, then Sir David Owen's report has served a very useful purpose and at the same time has added much valuable information on the subject under review.

It is really quite immaterial who first put forward the idea of an Advisory Board, but, as I happen to have been the one who did so, I would like to take this opportunity of stating that the Harbour Board created by the Government in 1929 in no way reflected the *Impartial Tribunal* which I envisaged as the first need of the Port. As Sir David Owen says its constitution "seemed hardly a happy one." I would even go farther in saying that it would be ridiculous to expect a Board so constituted to produce any results.

In November, 1920, I had the pleasure of daily contact, over a period of three weeks, with the late Sir Maurice Fitzmaurice, when he visited Hong Kong at the invitation of the Government. Knowing his views as I do, I would like to avail myself of this opportunity of stating that I concur with Sir David Owen that it was not the intention of Messrs. Coode, Fitzmanrice, Wilson and Mitchell that a Port Trust in Hong Kong should operate any of the facilities which may be provided and/or controlled by it. It is unfortunate that, in their report in 1922, the word "manage" was introduced, for, quite naturally, it would lead to misconception of the Consulting Engineers' recommendations in regard to administration of the business of the Port.

Constitution of the Board

Before passing to comment on the physical developments proposed I would like to make an observation on the proposed constitution of the Trust which Sir David Owen recommends should remain in being for three years as an experiment.

Whilst he has made it quite clear that this proposed Body of Harbour Trustees should be an absolutely impartial one consisting of eight persons, including an independent chairman, three Government officials of high standing, three British subjects nominated by the Hong Kong General Chamber of Commerce and one person nominated by the Chinese Chamber of Commerce, I note he suggests that a quorum at any meeting should be four, and

Port of Hong Kong— *continued*

that no Trustee " should be allowed to vote on any question directly affecting his own or his firm's business."

In order that the Trust should function satisfactorily it is absolutely essential that goodwill and mutual trust exist amongst all peoples who have any interests in the Port. For this reason I would suggest an addition to the effect that " no Trustee be allowed to vote on any question directly affecting his own or his firm's business or *interests*." In this connection may I draw attention to a situation which may quite conceivably arise? And believe me this is no idle flight of fancy!

One or all three British unofficial members of the Trust may quite possibly be directors of The Wharf and Godown Co., or of The Hong Kong and Whampoa Dock Co., or of The Star Ferry Co., or even of all three. A question of development for the benefit of Messrs. Alfred Holt and Co. (a private company) competitors of The Hong Kong Wharf and Godown Co. may arise. Likewise for Taikoo Dock Co. (a private company) competitors of The Hong Kong and Whampoa Dock Co., or for one of the Chinese Ferry Co.'s which may be competitors of The Star Ferry Co. In such circumstances, I am afraid, if the British member or members were allowed to vote, a spirit of apprehension may arise and develop into one of mistrust amongst some of the parties concerned. On the other hand, if they were not allowed to vote, the Trust may at times become bureaucratic. Such contingencies should be guarded against.

Another situation that constantly occurs in the tropics is that due to the fact that for reasons of health, it is necessary every three or four years for white people to reside for some time (usually 6 months) in a temperate climate. Doubtless someone would be appointed to take the place of the absent member, but he may not be so conversant with the work of the Trust. It will be gathered, therefore, that the constitution of the Trust would be virtually in a state of constant change and so here again may deteriorate into a bureaucratic body.

It is agreed by all that membership of the Trust should be restricted to the fewest number compatible with securing true efficiency in its work in the best interests of the Colony and all concerned with its harbour, but, having regard to such contingencies, and there may quite possibly be other special circumstances that, by frank and free discussion may come to light, I think it would be well to increase the membership of the Trust, including the chairman, from eight to eleven by the appointment of three additional British subjects, also to be nominated by the Hong Kong General Chamber of Commerce.

This letter is already sufficiently lengthy, so I propose to deal with the proposals for Physical Development in a subsequent communication.

Yours faithfully,

Westbury-on-Trym, Bristol. JOHN DUNCAN.

12th January, 1942.

Correspondence

To the Editor of "The Dock and Harbour Authority"

PORT OF CANTON.

Dear Sir,—

With reference to the article about the Port of Canton which appeared in your August issue, 1941, it may be of interest to you to know that the modern type of wharf at Whampoa—for the construction of which the Whampoa Port Development Administration allotted a contract to our Company in April of 1937—was actually completed and delivered to the Chinese Government in September, 1938, about one month before the Japanese invasion of Canton and its adjoining territories. The length of the wharf is about 1,100-ft. with a reclamation behind the wall of about 550-ft. in width. Larssen steel sheet piling was used to about low water level, supporting, together with one row of wooden piles, a mass concrete wall with granate ashlar facing and concrete coping for the part of the wall above water level. In addition a considerable amount of dredging was done by our Company in the Canton River near Whampoa; a quantity of over 300.000 M3 (measured in profile) was removed from the first bar and a quantity of 250.000 M3 from the second bar.

The building of the quay wall, as well as the dredging done, were certainly meant as an initial phase of the construction of port facilities on a very large scale, whereby it was intended to make use to the fullest extent of the extraordinary favourable local conditions, which undoubtedly warrant the construction of a world port at Whampoa. Sad events have put a temporary end to such plans, but, without doubt, better times will see them taken up again zealously.

Yours faithfully,

NETHERLAND HARBOUR WORKS CO.

Hong Kong.

14th October, 1941.

Dock Labour Schemes for South Wales Ports

During the month of February, dock labour schemes, approved by the Ministry of Labour, will come into operation at a number of ports in South Wales. The scheme for Swansea makes a start on February 2nd; that for Port Talbot and Llanelly follows on February 9th; Barry and Newport on February 16th and Cardiff on February 23rd.

The area board responsible for the operation of the local scheme is composed of Messrs. T. E. Merrells, chairman; H. Batey, J. Donovan, W. J. Fletcher, J. T. Edmunds and W. Pinnell. Mr. E. Leonard Davies is the area manager and the sub-managers, whose appointments have now been confirmed, are Messrs. W. H. Jones, until recently head of the general cargo section, G.W.R., Cardiff, for Cardiff; J. H. Saunders, sub-manager, Swansea Docks Labour Exchange, for Swansea; George Farr, official of the Transport and General Workers' Union, Newport, for Newport; Rex Thomas, outside representative of the Barry Dock Manager, for Barry; H. W. Horsham, outside representative of the Port Talbot Dock Manager, for Port Talbot; and J. Winterbottom, Superintendent of the Llanelly Harbour Trust, for Llanelly.

Employers and the Transport and General Workers' Union who are vitally interested in the matter have been invited to form local committees to assist the South Wales area board in operating the scheme. Under the scheme, which was formulated in the Essential Work (Dock Labour) Order, all registered dockers—other than weekly workers—become employees of the National Dock Labour Corporation.

The men will receive a guaranteed wage in the form of attendance money, payable at the rate of 5s. in respect of each attendance proved, when the man concerned does not obtain employment. Grade A workers will make 11 calls per week, Grade B 9, and Grade C 6. The top grade men are those capable of working a full week and the other two grades those who for physical or other reasons can only work part of a week.

Publications Received

Rope Talks is an attractively got-up little pamphlet descriptive of various institutions and undertakings associated with the use of ropes. There is a wide range of interest, the contents covering the establishment known as " Lloyds'," Tottenham's system of dealing with waste material, a Brazilian mountain railway, the manufacture of golf clubs and the fishing industry. A number of interesting facts are given with a series of artistic photographs. Copies of the brochure can be obtained from the publishers, British Ropes, Ltd., of Carr Hill, Doncaster.

War-time Building Bulletin No. 18, **" Fire Stops for Timber Roofs,"** which has just been issued by the Building Research Station of the Department of Scientific and Industrial Research, describes simple structural devices that can be erected to check the spread of fire along roofs containing timber or other combustible material. In tests carried out at the Building Research Station on two small roofs, the devices proved to be effective in stopping a fire, and it is believed that they would provide a useful check on large roofs, and might be of service in connection with shedding used for timber storage in dock areas. Copies of the Bulletin may be obtained from H.M. Stationery Office, price 1s. net.

Coastal Sandhills

(*Concluded from page 64*)

the 1845 Ordnance Survey Map now marks Fleetwood Road at Marshide and Southport promenade.

In strange contrast to this increasing estuary shore north of Southport is the erosion going on at the duneland between Freshfield and Formby Point during on-shore storms about flood tide. The great winds that shift the sands and move the sandhills sometimes expose lost wrecks of former years, revealing so many as eight wrecked ships at a time. At Altcar, about 400 acres of land have been reclaimed from the sea by planting brushwood groynes. Sand, blown by the wind, has accumulated against these and so provided the new land as mentioned earlier in these notes.

I have drawn most of my examples from the Lancashire coast because there have probably been greater changes on this important coast this century than in any other part of the country, and full use has been made of experiments in this area to fix the sandhills with star-grass and pine forest, to fix the mud banks with Spartina grass, and to extend the area of foreshore by planting brushwood groynes. In addition to the problems of this extensive sand belt, there has been the meandering course of the river Alt, north of the Mersey, which has an unstable estuary of 2½ miles, which necessitated the use of extensive tin slag embankments to check its serious damage to property by erosion. Although it reaches the sea at Hightown, the river Alt continues another 2½ miles down the coast before entering the sea, thus adding a considerable amount of eroded sand to Liverpool Bay.

Notes of the Month

Extensions at Port of Bandar Shahpur.

It is stated that a British firm has been commissioned to undertake work which will double the capacity of the harbour of Bandar Shahpur, Iran. Work has been begun on a new jetty which will be used for supplies to Russia.

Dundee Harbour Appointment.

Mr. Norman A. Matheson, M.Inst.C.E., who, six months ago, was appointed Engineer to the Dundee Harbour Trust in succession to Mr. J. Hannay Thompson, has now been made general manager as well as engineer. Mr. Thompson likewise held both offices up to the time of his retirement.

Increase in Port Dues at Dublin.

Various increases in harbour dues have been announced by the Dublin Port and Docks Board. Tonnage rates on vessels from foreign ports will be raised on February 15th from 1s. 1d. to 1s. 8½d. per ton and on ships from cross-channel and Irish ports there will be an increase from 3½d. to 1s. 1d. per ton. The cargo rate is to be increased by 33⅓rd per cent.

Seamens' Welfare at British Ports.

Leaflets are being issued to seamen at all ports where Seamen's Welfare officers have been appointed, setting out the arrangements for recreation, hospital and clinical treatment, with other information likely to be of service, such as advice regarding accommodation, use of canteens, travelling facilities, etc.

New Graving Dock at Boston, Mass.

It is announced by the U.S.A. Bureau of Yards and Docks that a concrete graving dock is to be constructed at the Naval Base, South Boston, Mass. Dimensions have not been received, but construction is to be carried out in the dry within a cellular steel sheet piled dam, and it seems probable that the work will be commensurable with the existing large graving dock.

Dublin Port Traffic.

It was reported at a recent meeting of the Dublin Port and Docks Board that traffic at the port had been seriously affected by the war and the outbreak of foot and mouth disease, resulting in a loss of about £31,000 on the working in 1941. Mr. P. Magrath was re-elected chairman and Mr. T. O'Connor vice-chairman of the board.

New Life-Saving Raft.

An interesting test was made at Cardiff Docks on January 25th, when the trial took place of a new type of reversible life-saving raft. Shaped like a boat, it is adapted for propulsion by rowing to enable survivors from abandoned or sinking vessels to be picked up and rescued. The opinion formed was that the new type, which can seat a dozen men in comfort, was a great improvement on the old type. The raft is constructed by the Diamond Boat-building Company, Ltd., of Cardiff.

Port Regulations at Lisbon.

The maritime authorities at the Port of Lisbon have issued instructions that all merchant ships, whether national or foreign, must wait in the Bay of Cascaes for a pilot to bring them into the port of Lisbon, if that is their destination. Entry into the port will only be permitted after the ships' documents have been examined. Portuguese fishing craft may enter and leave freely during the day time, but at night time must be duly authorised by the pilot boats at Cascaes or the Port Captain.

Business Announcement.

A scheme for collaboration has been arranged between two of the oldest established firms in the nautical instrument industry—Messrs. Henry Hughes and Son, Ltd., of London, have joined forces with Messrs. Kelvin, Bottomley and Baird, Ltd., of Glasgow, under the title of Marine Instruments, Ltd. The directors are Sir Allan Gordon-Smith and Mr. A. J. Hughes, of Henry Hughes and Sons, Ltd., and Mr. F. A. King, and Mr. A. A. King, of Kelvin, Bottomley and Baird, Ltd.

Visit of Soviet Delegates to Liverpool Docks.

During their tour of the North-Western area of Great Britain, the Soviet delegation of trade union leaders, accompanied by Sir Walter Citrine, visited the Liverpool Docks and were warmly welcomed by the dockers. In an interview with Mr. R. J. Hodges, the General Manager of the Mersey Docks Board, the suggestion was made by a member of the delegation that many of the operations could be mechanised. Mr. Hodges replied that schemes of reconstruction were under consideration and the various interests, including the men, were being consulted. Another delegate recommended the more extended application of the system of piecework which was found to work well in Russia.

Liverpool Dock Access Committee.

Application has been made to the Ministry of War Transport by the road haulage associations of Liverpool for representation on the Liverpool Dock Access Committee, which has been formed to consider the present limitations of the existing dock road and railway lines and the means of improving access to the docks.

Developments at Port of Quequen.

The Argentine Government have made a decree, authorising the expenditure of 25,000,000 pesos on improvements at the Port of Quequen, or Necochea, in the province of Buenos Aires. The outlay is to be spread over a period of ten years, dating from the beginning of 1940.

Mersey Docks and Harbour Board.

At a recent meeting of the Mersey Docks and Harbour Board, Sir Thomas A. L. Brocklebank was re-elected chairman for the ensuing twelve months and Mr. Edmund Gardner, deputy-chairman. Mr. Charles McVey has been re-appointed a member of the Board as a representative of the Ministry of War Transport.

New President of American Association of Port Authorities.

Mr. John M. Wilson, who has been in charge of public works for the Federal Government in Central Ontario, Canada, for the past 27 years, has been elected president of the American Association of Port Authorities for the current year. Mr. Wilson has designed and built a number of harbours on the shores of the Great Lakes.

Dock Labour Schemes.

The first of the dock labour schemes under the Essential Work (Dock Labour) Order, 1941, is that of Bristol which came into operation on December 29th and covers also Avonmouth and Portishead and the river port of Sharpness. The local governing body consists of employers and workers with Mr. J. H. Bennett as chairman. Dock labour schemes have also been approved for the ports of Falmouth, Goole and Hull.

Proposed Connection of Santa Fé and Paranà.

A Commission has been appointed to consider the possibility of connecting the cities of Santa Fé and Paranà on opposite banks of the River Paraguay either by a bridge or by a tunnel. The Commission includes representatives of the Ports and Navigation Department, the National Roads Board and of the State Railways. The Port of Santa Fé does a considerable river trade and provides accommodation for shipping drawing up to 25-ft. There is a grain elevator and supplies of coal and oil fuel are available.

Developments at Port of Fécamp.

A programme of port improvements estimated to cost 350 million francs has been put forward by the Fécamp Chamber of Commerce. In order to enable vessels to enter in all weathers two breakwaters are to be constructed, one from Cap Fagnet and the other from the northern end of the beach; the width of the entrance, between the moles at the end of these breakwaters, will be 100 metres. The facilities for careening are are also to be improved. The scheme provides for the construction of a maritime station with a quay connected to the main railway station, and for modern equipment on the quays. A fish hall, 240 metres long and 40 metres wide, including refrigerating chambers, is also to be built.

North-East Coast Transport.

Mr. B. Eliot Common, Regional Port Director in the North-East area has addressed a New Year message to transport workers in which he says: " The North-East Coast has much to be proud of in the way it has responded to the request of the Minister of War Transport to speed-up the turn-round of ships during 1941. An even greater effort is, however, required from all of us in 1942, and I ask that all who are engaged in the movement and working of ships to give of their utmost and to play their part in ensuring that the North-East Coast leads the way in an even quicker turn-round of ships during the coming year."

Anchorage Regulations in the United States.

On the authorisation of the President, anchorage regulations for vessels in navigable waters of the United States have been issued by the Treasury Department as an important feature in the national defence programme. These regulations involve considerable restriction of movement, but, in order to prevent their being unduly burdensome on shipping, they have been supplemented by the granting of a general licence for the free movement of certain classes of vessels, issued by the Commandant of the Coastguard under whose direction the captains of the ports throughout the country operate. This free movement is, as might be expected, subject to certain restrictions in the vicinity of navy yards, arsenals and other prescribed types of waterfront.

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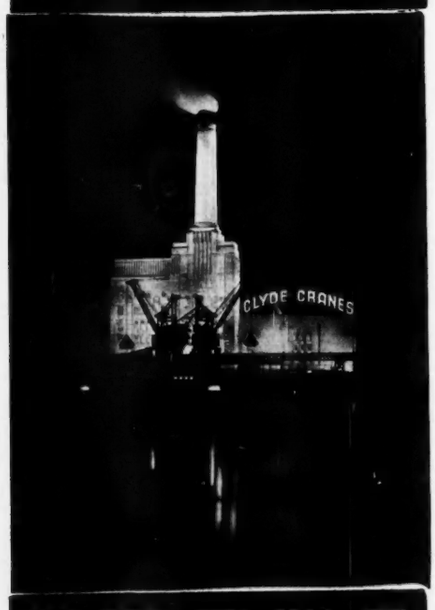

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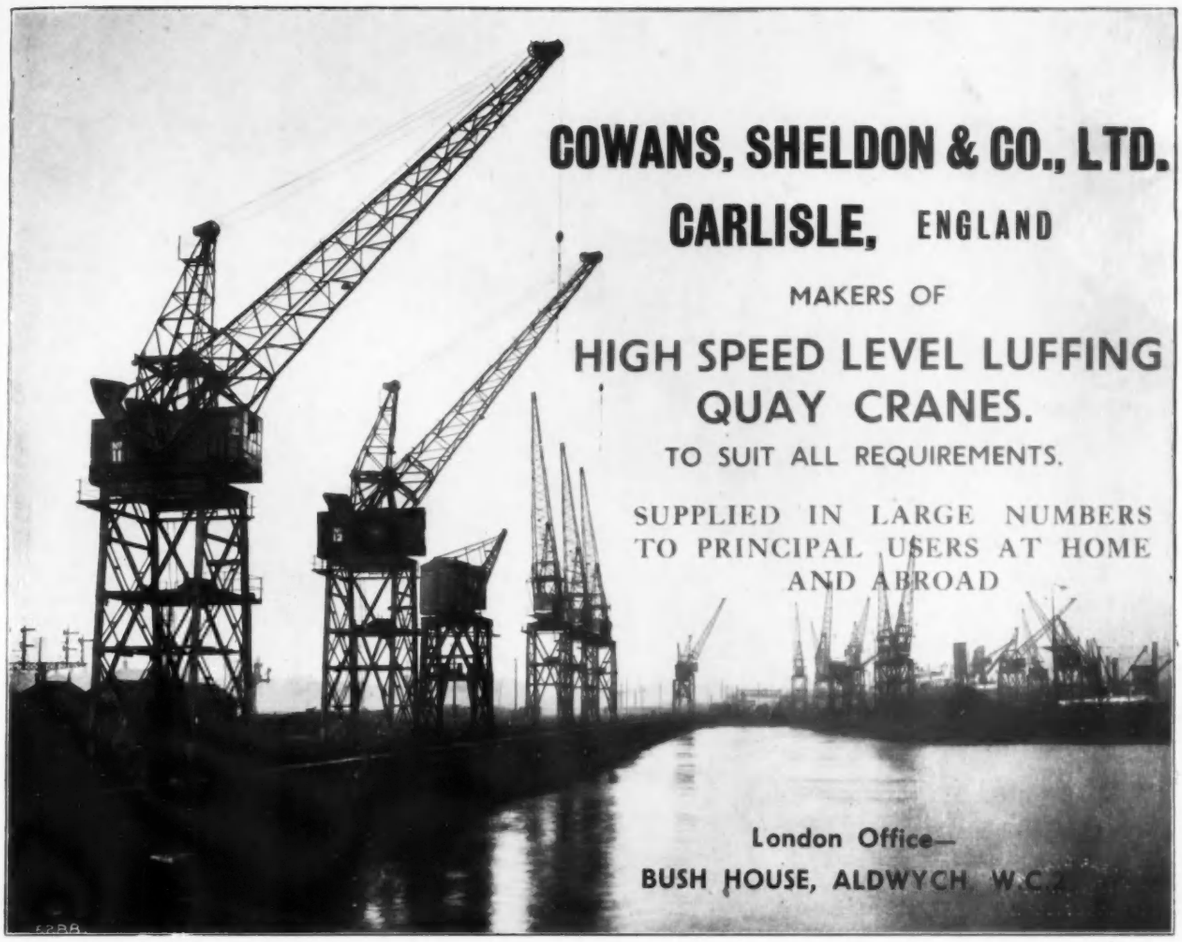
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